

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 19,0 n5
 Edition : 12.01.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 400 640 114
 Injection pump
 Pump designation : PE12A95D610LS2590
 EP type number : 0 410 690 995
 Governor
 Governor design. : RQV300...1150AB1086-
 1L
 Governor no. : 0 420 212 221
 Customer-spec. information
 Customer : KHD
 Engine : F12L413F
 1st version kW : 247.0
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder assembly : 0 681 343 009

Opening pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter x Wall thickness x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.50...1.60
 : (1.45...1.65)

Rack travel in mm : 9.00...12.00
 Firing order : 1-4-9-8-5-2-
 11-10-3-6-7-12

Phasing : 0-15-60-75-120-135-
 180-195-240-255-300-
 315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1130

Rack travel in mm : 9.90...10.00

Del.quantity cm³/ : 8.4...8.6

100 s: (8.2...8.8)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 600.0

Rack travel in mm : ?

Del.quantity cm³/ : 1.2...1.8

100 s: (0.9...2.0)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed	rpm	: 600
travel mm		: 1.40...1.50
2nd speed	rpm	: 615
travel mm		: 1.70...1.90
3rd speed	rpm	: 665
travel mm		: 2.80...3.00
4th speed	rpm	: 1180
travel mm		: 8.50...8.60
5th speed	rpm	: 1225
travel mm		: 9.30...9.40

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1165

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1130

Del.quantity : 84.0...86.0
1000 : (82.0...88.0)
Spread cm³ : 3.50
1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 117...125

Testing:
1st rack travel in: 8.90
Speed rpm : 1170...1180
2nd rack travel in: 4.00
Speed rpm : 1210...1240
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 83...91

Testing:
Speed rpm : 300
Minimum rack trave: 10.50
Speed rpm : 600
Rack travel in mm : 5.90...6.10

CONSTANT REGULATION
Speed rpm : 600...670

TORQUE CONTROL
Dimension a mm : 0.90
Torque control curve - 1st version
1st speed rpm : 1130
Rack travel in m: 9.90...10.00
2nd speed rpm : 800
Rack travel in m: 10.80...10.90
3rd speed rpm : 945
Rack travel in m: 10.60...10.70
4th speed rpm : 1030
Rack travel in m: 10.10...10.30

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 800
Del.quantity cm³/ : 90.5...93.5
1000 s: (88.0...96.0)

RACK STOP ADJUSTMENT

Speed rpm : 500

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 8.90
Speed rpm : 1170...1180

Remarks:

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Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,
the start position must be reached.

APPLICATION

Compressor

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 12,7 p8
 Edition : 19.10.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 400 648 118
 Injection pump
 Pump designation : PE8A95D410LS2608
 EP type number : 0 410 698 988
 Governor
 Governor design. : RQV750AB1041L
 Governer no. : 0 420 212 109
 Customer-spec. information
 Customer : KHD
 Engine : F8L413F
 1st version kW : 117.0
 Rated speed : 1500
TEST BENCH REQUIREMENTS
 Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 000
 Inlet press., bar : 1.50
 Test nozzle holder assembly : 0 681 343 009
 Opening pressure, bar : 172...175
 Test lines : 1 680 750 014
 Outside diameter x Wall thickness x Length mm : 6.00X2.00X600
 (A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____
BEGINNING OF DELIVERY
 Test pressure, bar: 25...27
 Prestroke mm : 2.00...2.10
 : (1.95...2.15)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 8- 7- 2- 6- 5-
 4- 3

Phasing : 0-45-90-135-180-225-
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 720

Rack travel in mm : 10.60...10.70

Del.quantity cm³/ : 9.7...9.9

100 s: (9.5...10.1)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.3...6.5

Del.quantity cm³/ : 1.3...1.9

100 s: (1.0...2.1)

Spread cm³ : 0.3

100 s: (0.5)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 720

Del.quantity : 97.0...99.0

1000 : (95.0...101.0)

Spread cm³ : 3.00

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 21...29

Testing:

1st rack travel in: 9.60

Speed rpm : 753...758

2nd rack travel in: 4.50

Speed rpm : 775...785

START CUT-OUT

Speed 1/min : 680 (700)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 9.60
Speed rpm : 753...758

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 116.5...126.5
1000 s: (113.5...129.5)

Remarks:

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APPLICATION

Generator set

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 15.8 c3
 Edition : 17.10.90
 Replaces : 15.8.89
 Test oil : ISO-4113
 Combination no. : 0 400 649 244
 Injection pump
 Pump designation : PE10A95D610/4LS2452
 EP type number : 0 410 699 998
 Governor
 Governor design. : RQV300...1100AB1055-
 1L
 Governor no. : 0 420 212 215
 Customer-spec. information
 Customer : KHD
 Engine : F10L413F
 1st version kW : 198.0
 Rated speed : 2200
TEST BENCH REQUIREMENTS
 Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 000
 Inlet press., bar : 1.50
 Test nozzle holder assembly : 0 681 343 009
 Opening pressure, bar : 172...175
 Test Lines : 1 680 750 014
 Outside diameter x Wall thickness x Length mm : 6.00X2.00X600
(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____
BEGINNING OF DELIVERY
 Test pressure, bar: 25...27
 Prestroke mm : 2.00...2.10
 : (1.95...2.15)

Rack travel in mm : 9.00...12.00
 Firing order : 1-10- 9- 4- 3- 6-
 5- 8- 7- 2

Phasing : 0-27-72-99-144-171-
 216-243-288-315
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 9.60...9.70

Del.quantity cm³/

100 s: (8.4...9.0)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0
 Rack travel in mm : 6.4...6.6
 Del.quantity cm³/

100 s: (0.9...2.0)

Spread cm³ : 0.5
 100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed	rpm	: 350
	travel mm	: 0.70...1.20
2nd speed	rpm	: 395
	travel mm	: 1.50...2.00
3rd speed	rpm	: 820
	travel mm	: 554.00...5.90
4th speed	rpm	: 1150
	travel mm	: 8.00...8.50
5th speed	rpm	: 1450
	travel mm	: 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1
 Speed rpm : 1130
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version		
Speed	rpm	: 1100
Del.quantity		: 86.0...88.0
	1000	: (84.0...90.0)

Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version

Control lever
position degrees: 112...120

Testing:

1st rack travel in: 8.60
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1210...1240
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 57...65

Testing:

Speed rpm : 100
Minimum rack trave: 8.00
Speed rpm : 350
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION

Speed rpm : 450...500

TORQUE CONTROL

Dimension a mm : 0.90
Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 9.60...9.70
2nd speed rpm : 750
Rack travel in m: 10.50...10.60
3rd speed rpm : 910
Rack travel in m: 10.30...10.50
4th speed rpm : 1000
Rack travel in m: 9.80...10.00

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 750
Del.quantity cm³/ : 95.5...98.5
1000 s: (93.0...101.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 8.60
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 120.0...130.0
1000 s: (117.0...133.0)
Rack travel in mm : 13.50...14.20

Remarks:

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APPLICATION

Wheel Loader

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 12,7 r1
 Edition : 15.08.89
 Replaces : 7.2.89
 Test oil : ISO-4113

 Combination no. : 0 400 678 040

 Injection pump
 Pump designation : PE8A95D410LS2451
 EP type number : 0 410 698 988
 Governor
 Governor design. : RSV300...1325A8C1002
 Governor no. : 0 420 232 310

 Customer-spec. information
 Customer : KHD

 Engine : F8L413F

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

 Overflow valve : 1 417 413 000

 Inlet press., bar : 1.50

 Test nozzle holder assembly : 0 681 343 009

 Opening pressure, bar : 172...175

 Test lines : 1 680 750 014

 Outside diameter x Wall thickness x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10
 : (1.95...2.15)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 8- 7- 2- 6- 5-
 : 4- 3

Phasing : 0-45-90-135-180-225-
 : 270-315
 Tolerance + - ° : 0.50 (0.75)
 Time to cyl. no. : 1

BASIC SETTING

1st speed	rpm	: 1325
<hr/>		
Rack travel in mm	: 9.70...9.80	
<hr/>		
Del.quantity cm ³ /	: 9.1...9.3	
<hr/>		
100 s:	(8.9...9.5)	
<hr/>		
Spread	cm ³	: 0.3
<hr/>		
100 s:	(0.6)	
<hr/>		
2nd speed	rpm	: 300.0
Rack travel in mm	: 5.9...6.1	
Del.quantity cm ³ /	: 0.9...1.5	
100 s:	(0.6...1.7)	
Spread	cm ³	: 0.5
100 s:	(0.9)	

GUIDE SLEEVE POSITION
 Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version	Speed	rpm	: 1325
	Del.quantity	: 91.5...93.5	
	1000	: (89.5...95.5)	
	Spread	cm ³	: 3.00
		1000	: (6.00)

RATED SPEED

1st version
 Control lever
 position degrees: 109...117

Testing:
 1st rack travel in: 8.70
 Speed rpm : 1365...1375
 2nd rack travel in: 4.00
 Speed rpm : 1390...1420
 4th rack travel in: 1575
 Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 66...74
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.50

Testing:
Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 300
Rack travel in mm : 5.90...6.10
Rack travel in mm : 2.00
Speed rpm : 310...370
Speed rpm : 700
Maximum rack trave: 1.00

SET IDLE AUXILIARY SPRING
Rack travel in mm : 2.00

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 1325
Rack travel in m: 9.70...9.80
2nd speed rpm : 500
Rack travel in m: 10.00...10.10

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 8.70
Speed rpm : 1365...1375

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 116.5...127.5
1000 s: (113.5...130.5)
Rack travel in mm : 14.00...14.40

HIGH IDLE

1st version
Rack travel in mm : 3.90...4.10
Spread cm³ : 10.00
1000 s: (-)

Remarks:
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BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 5,7 e 3
 Edition : 19.10.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 400 846 280
 Injection pump
 Pump designation : PES6A80D410RS2085Z
 EP type number : 0 410 886 043
 Governor
 Governor design. : RQV300...1475AB532DL
 Governer no. : 0 420 214 056
 Customer-spec. information
 Customer : DAIMLER-BENZ
 Engine : OM 352
 1st version kW : 74.0
 Rated speed : 2950
TEST BENCH REQUIREMENTS
 Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 000
 Inlet press., bar : 1.50
 Test nozzle holder assembly : 0 681 343 009
 Opening pressure, bar : 172...175
 Test lines : 1 680 750 014
 Outside diameter x Wall thickness x Length mm : 6.00X2.00X600
(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____
BEGINNING OF DELIVERY
 Test pressure, bar: 25...27
 Prestroke mm : 2.15...2.25
 : (2.10...2.30)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1450

Rack travel in mm : 7.90...8.00

Del.quantity cm³/ : 4.3...4.4

100 s: (4.1...4.5)

Spread cm³ : 0.2

100 s: (0.3)

2nd speed rpm : 300.0

Rack travel in mm : 7.5...7.7

Del.quantity cm³/ : 0.9...1.5

100 s: (0.7...1.6)

Spread cm³ : 0.2

100 s: (0.3)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1495

travel mm : 8.50...8.60

2nd speed rpm : 950

travel mm : 5.00...5.30

3rd speed rpm : 750

travel mm : 3.90...4.40

4th speed rpm : 550

travel mm : 2.70...3.00

5th speed rpm : 300

travel mm : 0.70...1.20

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1495

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1450

Del.quantity : 43.0...44.0

1000 : (41.5...45.5)

Spread cm³ : 2.00

1000 : (3.50)

RATED SPEED

1st version
Control lever
position degrees: 99...117

Testing:

1st rack travel in: 6.90
Speed rpm : 1505...1515
2nd rack travel in: 4.00
Speed rpm : 1560...1590
4th rack travel in: 1700
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 64...72

Testing:

Speed rpm : 100
Minimum rack trave: 9.00
Speed rpm : 300
Rack travel in mm : 7.50...7.70

CONSTANT REGULATION

Speed rpm : 430...540

TORQUE CONTROL

Dimension a mm : 1.20
Torque control curve - 1st version
1st speed rpm : 1450
Rack travel in m: 7.90...8.00
2nd speed rpm : 500
Rack travel in m: 9.10...9.20
3rd speed rpm : 770
Rack travel in m: 8.80...9.00
4th speed rpm : 1000
Rack travel in m: 8.10...8.40

START CUT-OUT

Speed 1/min : 220 (240)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 6.90
Speed rpm : 1505...1515

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ 1000 s: 71.0...81.0
Rack travel in mm : 12.90...13.30

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 6,2 p 2
 Edition : 31.08.90
 Replaces : 19.3.90
 Test oil : ISO-4113
 Combination no. : 0 400 846 538
 Injection pump
 Pump designation : PES6A95D320RS2693
 EP type number : 0 410 896 914
 Governor
 Governor design. : RQ300/1300AB1204R
 Governer no. : 0 420 201 640
 Customer-spec. information
 Customer : DAF
 Engine : DNT 620
 1st version kW : 130.0
 Rated speed : 2600
TEST BENCH REQUIREMENTS
 Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 000
 Inlet press., bar : 1.50
 Test nozzle holder assembly : 0 681 343 009
 Opening pressure, bar : 172...175
 Test lines : 1 680 750 015
 Outside diameter x Wall thickness x Length mm : 6.00x1.50x600
 (A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____
BEGINNING OF DELIVERY
 Test pressure, bar: 25...27
 Prestroke mm : 2.00...2.10
 : (1.95...2.15)
 Rack travel in mm : 7.50...10.50

Firing order : 1- 5- 3- 6- 2- 4
 Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)
 Time to cyl. no. : 1
BEGINNING OF DELIVERY DIFFERENCE
 betw. rack trav. m: 8.50...9.50
 & maximum rack tra: 21.00
 Difference ° CS : 2.50...3.50
BASIC SETTING
 1st speed rpm : 850
 Rack travel in mm : 11.50...11.60
 Del.quantity cm³/ : 7.6...7.7
 100 s: (7.4...8.0)
 Spread cm³ : 0.3
 100 s: (0.6)
 2nd speed rpm : 300.0
 Rack travel in mm : 6.6...6.8
 Del.quantity cm³/ : 0.7...1.1
 100 s: (0.4...1.3)
 Spread cm³ : 0.3
 100 s: (0.5)
GUIDE SLEEVE POSITION
 Control-lever position
 Degree: -2
 Speed rpm : 800
 Rack travel in mm : 19.20...20.80
FULL LOAD DELIV. AT FULL LOAD STOP
 1st version
 Speed rpm : 850
 Aneroid pressure h: 700
 Del.quantity : 76.5...77.5
 1000 : (74.5...79.5)
 Spread cm³ : 3.50
 1000 : (6.00)
RATED SPEED
 1st version
 Setting point:
 Speed rpm : 800
 Rack travel in mm : 20.0

Testing:
 1st rack travel in: 9.70
 Speed rpm : 1350...1365
 2nd rack travel in: 4.00
 Speed rpm : 1420...1450
 4th rack travel in: 1550
 Speed rpm : 0.00...1.00

LOW IDLE 1
 Setting point w/out bumper spring
 Speed rpm : 300
 Rack travel in mm : 6.7

Testing:
 Speed rpm : 100
 Minimum rack trave: 8.00
 Speed rpm : 300
 Rack travel in mm : 6.60...6.80
 Rack travel in mm : 2.00
 Speed rpm : 540...580

TORQUE CONTROL
 Dimension a mm : 0.55
 Torque control curve - 1st version
 1st speed rpm : 1290
 Rack travel in m: 10.60...10.80
 2nd speed rpm : 850
 Rack travel in m: 12.00...12.40
 3rd speed rpm : 935
 Rack travel in m: 11.30...11.70
 4th speed rpm : 1080
 Rack travel in m: 10.80...11.10

Aneroid/Altitude Compensator Test

1st version
 Setting
 Speed rpm : 600
 Pressure hPa : 700
 Rack travel mm : 11.50...11.60

Measurement
 Speed 1/min : 600

1st pressure hPa : -
 Rack travel in m: 11.10...11.30
 2nd pressure hPa : 250
 Rack travel in m: 11.40...11.50

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
 Speed rpm : 1290
 Del.quantity cm³/ : 74.0...76.0
 1000 s: (71.5...78.5)
 Aneroid pressure h: -
 Speed rpm : 600
 Del.quantity cm³/ : 65.5...66.5
 1000 s: (63.5...68.5)

BREAKAWAY

1st version
 1mm rack travel less than

full load rack tr: 9.70
 Speed rpm : 1350...1365

STARTING FUEL DELIVERY

Speed rpm : 100
 Del.quantity cm³/ : 130.0...145.0
 1000 s: (127.0...148.0)
 Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 300
 Rack travel in mm : 6.50...6.70
 Del.quantity cm³/ : 7.0...11.0
 1000 s: (4.5...13.5)
 Spread cm³ : 3.50
 1000 s: (5.50)

Remarks:

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BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 6,2 p 5
 Edition : 28.09.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 400 846 586
 Injection pump
 Pump designation : PES6A95D320RS2693
 EP type number : 0 410 896 914
 Governor
 Governor design. : RQ300/1300AB1254R
 Governor no. : 0 420 201 651
 Customer-spec. information
 Customer : DAF
 Engine : NT 119
 1st version kW : 119.0
 Rated speed : 2600
TEST BENCH REQUIREMENTS
 Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 000
 Inlet press., bar : 1.50
 Test nozzle holder assembly : 0 681 343 009
 Opening pressure, bar : 172...175
 Test lines : 1 680 750 015
 Outside diameter x Wall thickness x Length mm : 6.00x1.50x600
 (A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____
BEGINNING OF DELIVERY
 Test pressure, bar: 25...27
 Prestroke mm : 2.00...2.10
 : (1.95...2.15)
 Rack travel in mm : 7.50...10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50
 & maximum rack tra: 21.00
 Difference ° CS : 2.50...3.50

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 10.80...10.90

Del.quantity cm³/ : 6.1...6.2

100 s: (5.9...6.4)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.2

Del.quantity cm³/ : 0.7...1.1

100 s: (0.4...1.3)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 850

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Del.quantity : 61.5...62.5

1000 : (59.5...64.5)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 850

Rack travel in mm : 20.0

Testing:
1st rack travel in: 9.30
Speed rpm : 1340...1350
2nd rack travel in: 4.00
Speed rpm : 1400...1430

APPLICATION

Omnibus

LOW IDLE 1
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.1

Testing:
Speed rpm : 200
Minimum rack trave: 6.50
Speed rpm : 300
Rack travel in mm : 6.00...6.20
Rack travel in mm : 2.00
Speed rpm : 500...540

TORQUE CONTROL
Dimension a mm : 0.32
Torque control curve - 1st version
1st speed rpm : 1290
Rack travel in m: 10.30...10.40
2nd speed rpm : 850
Rack travel in m: 11.10...11.40
3rd speed rpm : 975
Rack travel in m: 10.70...11.00
4th speed rpm : 1025
Rack travel in m: 10.50...10.70

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 1290
Del.quantity cm³/ 1000 s: 68.0...70.0
1000 s: (65.5...72.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 9.30
Speed rpm : 1340...1350

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.00...6.20
Del.quantity cm³/ 1000 s: 7.0...11.0
1000 s: (4.5...13.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM 4,1 b 3
 Edition : 05.11.90
 Replaces : 31.8.90
 Test oil : ISO-4113

Combination no. : 0 400 864 079

Injection pump
 Pump designation : PES4A90D320/3RS2659
 EP type number : 0 410 894 028
 Governor
 Governor design. : RSV325...1175AOC2247
 -1R
 Governor no. : 0 420 233 271

Customer-spec. information
 Customer : MWM

Engine : TD224/ 4

1st version kW : 72.0
 Rated speed : 2350

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder assembly : 0 681 343 009

Opening pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.95...3.05
 : (2.90...3.10)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...0.00
 & maximum rack tra: 21.00
 Difference ° CS : 3.50...4.50

BASIC SETTING

1st speed rpm : 1175

Rack travel in mm : 10.80...10.90

Del.quantity cm³/ : 8.0...8.1

100 s: (7.8...8.3)

Spread cm³ : 0.3

100 s: (0.5)

2nd speed rpm : 325.0
 Rack travel in mm : 7.0...7.2
 Del.quantity cm³/ : 0.8...1.4
 100 s: (0.6...1.6)
 Spread cm³ : 0.2
 100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1175

Aneroid pressure h: 700

Del.quantity : 80.5...81.5
 1000 : (78.5...83.5)
 Spread cm³ : 3.00
 1000 : (5.00)

RATED SPEED

1st version

Control lever

position degrees: 93...101

Testing:
 1st rack travel in: 9.80
 Speed rpm : 1215...1225
 2nd rack travel in: 4.00
 Speed rpm : 1250...1280
 3rd rack travel in: 4.00
 Speed rpm : 1270...1300
 4th rack travel in: 1430
 Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
 position degrees: 64...72
 Setting point w/out bumper spring
 Speed rpm : 325
 Rack travel in mm : 5.5

Testing:
 Speed rpm : 100
 Minimum rack trave: 19.50
 Speed rpm : 325
 Rack travel in mm : 5.90...6.10
 Rack travel in mm : 2.00
 Speed rpm : 480...540

TORQUE CONTROL

Torque control curve - 1st version
 1st speed rpm : 1175
 Rack travel in m: 10.80...10.90
 2nd speed rpm : 500
 Rack travel in m: 11.70...11.80
 4th speed rpm : 920
 Rack travel in m: 11.20...11.40

Aneroid/Altitude Compensator Test

1st version
 Setting
 Speed rpm : 600
 Pressure hPa : 700
 Rack travel mm : 11.50...11.60

Measurement
 Speed 1/min : 600

1st pressure hPa : -
 Rack travel in m: 10.70...10.80
 2nd pressure hPa : 230
 Rack travel in m: 11.10...11.30

FUEL DELIVERY CHARACTERISTICS

1st version
 Aneroid pressure h: 700
 Speed rpm : 750

Del.quantity cm3/ : 81.0...83.0
 1000 s: (78.5...85.5)
 Aneroid pressure h: 230
 Speed rpm : 600
 Del.quantity cm3/ : 72.5...74.5
 1000 s: (70.0...77.0)
 Aneroid pressure h: -
 Speed rpm : 500
 Del.quantity cm3/ : 63.0...64.0
 1000 s: (61.0...66.0)

BREAKAWAY

1st version
 1mm rack travel less than
 full load rack tr: 9.80
 Speed rpm : 1215...1225

STARTING FUEL DELIVERY

Speed rpm : 100
 Del.quantity cm3/ : 130.0...140.0
 1000 s: (127.0...143.0)
 Rack travel in mm : 19.50...21.00

Remarks: : RENAULT
 APPLICATION
 Tractor (tractor engines)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 6,2 q 1
 Edition : 05.11.90
 Replaces : 28.9.90
 Test oil : ISO-4113

 Combination no. : 0 400 876 375

 Injection pump
 Pump designation : PES6A95D320RS2693
 EP type number : 0 410 896 914
 Governor
 Governor design. : RSV300...1300AOC2251
 R
 Governor no. : 0 420 233 272

 Customer-spec. information
 Customer : DAF

 Engine : NT 119

 1st version kW : 119.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

 Overflow valve : 1 417 413 000

 Inlet press., bar : 1.50

 Test nozzle holder assembly : 0 681 343 009

 Opening pressure, bar : 172...175

 Test Lines : 1 680 750 015

 Outside diameter x Wall thickness x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

 Prestroke mm : 2.00...2.10
 : (1.95...2.15)

Rack travel in mm : 7.50...10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

 Tolerance + - ° : 0.50 (0.75)

 Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50
 & maximum rack tra: 21.00
 Difference ° CS : 2.50...3.50

BASIC SETTING

1st speed rpm : 850

 Rack travel in mm : 10.80...10.90

Del.quantity cm³/ : 6.1...6.2

 100 s: (5.9...6.4)

Spread cm³ : 0.3

 100 s: (0.6)

2nd speed rpm : 300.0
 Rack travel in mm : ?
 Del.quantity cm³/ : 0.7...1.1
 100 s: (0.4...1.3)

Spread cm³ : 0.3
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension
 Click setting x : 5.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 850
 Del.quantity : 61.5...62.5
 1000 : (59.5...64.5)

Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version

Control lever position degrees: 103...111	Spread	cm ³ : 3.50 1000 s: (5.50)
Testing:	Remarks:	:
1st rack travel in: 9.30 Speed rpm : 1340...1350		
2nd rack travel in: 4.00 Speed rpm : 1385...1415		
3rd rack travel in: 4.00 Speed rpm : 1410...1440		
4th rack travel in: 1570 Speed rpm : 0.30...1.40		
LOW IDLE 1		
Control lever position degrees: 73...81		
Setting point w/out bumper spring		
Speed rpm : 300		
Rack travel in mm : 5.6		
Testing:		
Speed rpm : 100		
Minimum rack trave: 19.50		
Speed rpm : 300		
Rack travel in mm : 6.00...6.50		
Rack travel in mm : 2.00		
Speed rpm : 560...620		
TORQUE CONTROL		
Torque control curve - 1st version		
1st speed rpm : 1290 Rack travel in m: 10.30...10.40		
2nd speed rpm : 500 Rack travel in m: 11.10...11.20		
4th speed rpm : 1050 Rack travel in m: 10.50...10.70		
FUEL DELIVERY CHARACTERISTICS		
1st version		
Speed rpm : 1290		
Del.quantity cm ³ / : 68.0...70.0 1000 s: (65.5...72.5)		
BREAKAWAY		
1st version		
1mm rack travel less than		
full load rack tr: 9.30		
Speed rpm : 1340...1350		
LOW IDLE		
Speed rpm : 300		
Del.quantity cm ³ / : 7.0...11.0 1000 s: (4.5...13.5)		

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 6,2 q 3
 Edition : 05.11.90
 Replaces : 14.9.90
 Test oil : ISO-4113

 Combination no. : 0 400 876 378

 Injection pump
 Pump designation : PES6A95D320RS2693
 EP type number : 0 410 896 914
 Governor
 Governor design. : RSV300...1300AOC2248
 -2R
 Governor no. : 0 420 233 274

 Customer-spec. information
 Customer : DAF

 Engine : NT 133

 1st version kW : 133.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

 Overflow valve : 1 417 413 000

 Inlet press., bar : 1.50

 Test nozzle holder assembly : 0 681 343 009

 Opening pressure, bar : 172...175

 Test Lines : 1 680 750 015

 Outside diameter x Wall thickness x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10
 : (1.95...2.15)

Rack travel in mm : 7.50...10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50

& maximum rack tra: 21.00

Difference ° CS : 2.50...3.50

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 11.50...11.60

Del.quantity cm³/ : 7.6...7.7

100 s: (7.4...7.9)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.2

Del.quantity cm³/ : 0.7...1.1

100 s: (0.4...1.3)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension
 Click setting x : 5.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 700

Del.quantity : 76.5...77.5

1000 : (74.5...79.5)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever
position degrees: 104...112

Testing:

1st rack travel in: 9.50
Speed rpm : 1340...1350
2nd rack travel in: 4.00
Speed rpm : 1390...1420
3rd rack travel in: 4.00
Speed rpm : 1410...1440
4th rack travel in: 1570
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 74...82
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.6

Testing:

Speed rpm : 100
Minimum rack trave: 19.50
Speed rpm : 300
Rack travel in mm : 6.00...6.50
Rack travel in mm : 2.00
Speed rpm : 560...620

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1290
Rack travel in m: 10.50...10.60
2nd speed rpm : 500
Rack travel in m: 11.80...11.90
4th speed rpm : 1070
Rack travel in m: 11.10...11.30

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 600
Pressure hPa : 700
Rack travel mm : 11.50...11.60

Measurement
Speed 1/min : 600

1st pressure hPa : -
Rack travel in m: 10.10...10.30
2nd pressure hPa : 250
Rack travel in m: 10.70...10.80

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 700

Speed rpm : 1290
Del.quantity cm3/ : 73.0...75.0
1000 s: (70.5...77.5)
Aneroid pressure h: -
Speed rpm : 600
Del.quantity cm3/ : 50.5...51.5
1000 s: (48.5...53.5)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 9.50
Speed rpm : 1340...1350

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.00...6.20
Del.quantity cm3/ : 7.0...11.0
1000 s: (4.5...13.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 c 9
 Edition : 16.08.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 400 876 380
 Injection pump
 Pump designation : PES6A90D410RS2710
 EP type number : 0 410 896 082
 Governor
 Governor design. : RSV350...1200A1C1163
 Governor no. : 0 420 232 546
 Customer-spec. information
 Customer : MERCEDES-BENZ
 Engine : OM 366
 1st version kW : 74.0
 Rated speed : 2400
TEST BENCH REQUIREMENTS
 Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 000
 Inlet press., bar : 1.50
 Test nozzle holder assembly : 0 681 343 009
 Opening pressure, bar : 172...175
 Test Lines : 1 680 750 015
 Outside diameter x Wall thickness x Length mm : 6.00X1.50X600
 (A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____
BEGINNING OF DELIVERY
 Test pressure, bar: 25...27
 Prestroke mm : 2.25...2.35
 : (2.20...2.40)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 9.30...9.40

Del.quantity cm³/ : 5.1...5.2

100 s: (4.9...5.4)

Spread cm³ : 0.3

100 s: (0.4)

2nd speed rpm : 370.0

Rack travel in mm : 7.9...8.5

Del.quantity cm³/ : 1.0...1.2

100 s: (0.8...1.4)

Spread cm³ : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Del.quantity : 51.0...52.0

1000 : (49.0...54.0)

Spread cm³ : 3.00

1000 : (4.50)

RATED SPEED

1st version

Control lever

position degrees: 109...117

Testing:

1st rack travel in: 8.30

Speed rpm : 1240...1245

2nd rack travel in: 4.00

Speed rpm : 1267...1280

4th rack travel in: 1400

Speed rpm : 0.30...1.40

Unimog

LOW IDLE 1

Control lever

position degrees: -3

Setting point w/out bumper spring

Speed rpm : 370

Rack travel in mm : 8.2

Testing:

Speed rpm : 100

Minimum rack trave: 19.50

Speed rpm : 370

Rack travel in mm : 8.10...8.30

Rack travel in mm : 2.00

Speed rpm : 460...520

TORQUE CONTROL

Dimension a mm : 1.30

Torque control curve - 1st version

1st speed rpm : 1200

Rack travel in m: 9.30...9.40

2nd speed rpm : 600

Rack travel in m: 10.00...10.20

3rd speed rpm : 900

Rack travel in m: 9.80...10.10

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600

Del.quantity cm³/ : 41.0...43.0
1000 s: (38.5...45.5)

Speed rpm : 900

Del.quantity cm³/ : 46.0...49.0
1000 s: (43.5...51.5)

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm³/ : 85.0...95.0
1000 s: (82.0...98.0)

Rack travel in mm : 16.80...17.20

LOW IDLE

Speed rpm : 370

Rack travel in mm : 7.90...8.50

Del.quantity cm³/ : 10.0...12.0
1000 s: (8.0...14.0)

Spread cm³ : 2.50
1000 s: (4.50)

Remarks:

:

APPLICATION

A22

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 20.9 s
 Edition : 05.11.90
 Replaces : 6.86
 Test oil : ISO-4113

Combination no. : 0 401 840 724

Injection pump
 Pump designation : PE12P120A520/4LS3828
 EP type number : 0 411 820 714
 Governor
 Governor design. : RQ250/1150PA739
 Governer no. : 0 421 801 279

Customer-spec. information
 Customer : MAN

Engine : D2842LE

1st version kW : 529.0
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 4.20...4.30
 : (4.15...4.35)
 Rack travel in mm : 9.00...12.00
 Firing order : 12- 1- 5- 9- 8- 3-
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-
 180-225-240-285-300-
 Phasing : 345
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 11.40...11.50

Del.quantity cm³/ : 19.5...19.7

100 s: (19.2...20.0)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 250.0
 Rack travel in mm : 6.6...7.0
 Del.quantity cm³/ : 1.7...2.3
 100 s: (1.4...2.6)
 Spread cm³ : 0.8
 100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 550

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 1000

Del.quantity : 195.0...197.0

1000 : (192.0...200.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 550

Rack travel in mm : 20.0

Testing:
 1st rack travel in: 10.40
 Speed rpm : 1220...1235
 2nd rack travel in: 4.00
 Speed rpm : 1415...1445
 4th rack travel in: 1550
 Speed rpm : 0.00...1.00

LOW IDLE 1
 Setting point w/out bumper spring
 Speed rpm : 250
 Rack travel in mm : 6.8

Testing:
 Speed rpm : 100
 Minimum rack trave: 8.30
 Speed rpm : 250
 Rack travel in mm : 6.70...6.90
 Rack travel in mm : 2.00
 Speed rpm : 315...355

TORQUE CONTROL
 Dimension a mm : -
 Torque control curve - 1st version
 1st speed rpm : 1150
 Rack travel in m: 11.40...11.50
 2nd speed rpm : 750
 Rack travel in m: 11.40...11.60

Aneroid/Altitude Compensator Test

1st version
 Setting
 Speed rpm : 500
 Pressure hPa : 1000
 Rack travel mm : 11.40...11.50

Measurement
 Speed 1/min : 500

1st pressure hPa : -
 Rack travel in m: 8.90...9.00
 2nd pressure hPa : 300
 Rack travel in m: 9.20...9.30
 3rd pressure hPa : 520
 Rack travel in m: 10.70...11.00

START CUT-OUT
 Speed 1/min : 170 (190)

FUEL DELIVERY CHARACTERISTICS

1st version
 Aneroid pressure h: 1000
 Speed rpm : 750

Del.quantity cm³/ 1000 s: 200.0...206.0
 1000 s: (197.0...209.0)
 Aneroid pressure h: -
 Speed rpm : 500
 Del.quantity cm³/ 1000 s: 119.0...121.0
 1000 s: (116.0...124.0)

BREAKAWAY
 1st version
 1mm rack travel less than
 full load rack tr: 10.40
 Speed rpm : 1220...1235

STARTING FUEL DELIVERY

Speed rpm : 100
 Del.quantity cm³/ 1000 s: 190.0...210.0
 1000 s: (186.0...214.0)

LOW IDLE
 Speed rpm : 250
 Rack travel in mm : 6.60...7.00
 Del.quantity cm³/ 1000 s: 17.0...23.0
 1000 s: (14.0...26.0)
 Spread cm³ : 8.00
 1000 s: (12.00)

Remarks: : MAN-NR. 2-7593

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 20,9 t
 Edition : 05.11.90
 Replaces : 7.86
 Test oil : ISO-4113

Combination no. : 0 401 840 725

Injection pump
 Pump designation : PE12P120A520/4LS3828
 EP type number : 0 411 820 714
 Governor
 Governor design. : RQV250...1150PA668-7
 Governor no. : 0 421 813 481

Customer-spec. information
 Customer : MAN

Engine : D2842LE

1st version kW : 560.0
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder assembly : 1 688 901 019

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 4.20...4.30
 : (4.15...4.35)
 Rack travel in mm : 9.00...12.00
 Firing order : 12- 1- 5- 9- 8- 3-
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-
 180-225-240-285-300-

Phasing Tolerance + - ° : 345
 : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 11.90...12.00

Del.quantity cm³/ : 20.0...20.2

100 s: (19.7...20.5)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 250.0
 Rack travel in mm : 6.9...7.1
 Del.quantity cm³/ : 1.7...2.3
 100 s: (1.4...2.6)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350
 travel mm : 2.00...2.50
 2nd speed rpm : 900
 travel mm : 6.70...6.90
 3rd speed rpm : 1150
 travel mm : 8.50...8.60

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1150
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1150
 Del.quantity : 200.0...202.0
 1000 : (197.0...205.0)

Spread cm³ : 5.00
 1000 : (9.00)

ship

RATED SPEED

1st version
Control lever
position degrees: 62...70

Testing:

1st rack travel in: 10.90
 Speed rpm : 1190...1200
 2nd rack travel in: 4.00
 Speed rpm : 1335...1365
 4th rack travel in: 1450
 Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 8...16

Testing:

Speed rpm : 100
 Minimum rack travel: 8.50
 Speed rpm : 250
 Rack travel in mm : 6.90...7.10
 Rack travel in mm : 2.00
 Speed rpm : 400...460

START CUT-OUT

Speed 1/min : 200 (220)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 10.90
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100
 Det.quantity cm³/ 1000 s: 190.0...210.0
 (186.0...214.0)

LOW IDLE

Speed rpm : 250
 Rack travel in mm : 6.90...7.10
 Del.quantity cm³/ : 17.0...23.0
 1000 s: (14.0...26.0)
 Spread cm³ : 8.00
 1000 s: (12.00)

Remarks: : MAN-NR. 2-7590

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : VOL 10,0 o6
 Edition : 24.10.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 401 846 745
 Injection pump
 Pump designation : PE6P110A320RS3080
 EP type number : 0 411 816 722
 Governor
 Governor design. : RQV250...1100PA919
 Governer no. : 0 421 813 776
 Customer-spec. information
 Customer : VOLVO
 Engine : TD 100 G

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 025
 Inlet press., bar : 1.50
 Test nozzle holder assembly : 0 681 343 009
 Opening pressure, bar : 172...174
 Test lines : 1 680 750 015
 Outside diameter x Wall thickness x Length mm : 6.00x1.50x-600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
 Prestroke mm : 3.50...3.60
 : (3.45...3.65)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.30...12.40

Del.quantity cm³/ : 16.7...16.9

100 s: (16.4...17.2)

Spread cm³ : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 3.9...4.1

Del.quantity cm³/ : 1.5...1.9

100 s: (1.2...2.1)

Spread cm³ : 0.3

100 s: (0.6)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 1.20...1.30

2nd speed rpm : 370

travel mm : 2.60...3.00

3rd speed rpm : 430

travel mm : 3.50...3.90

4th speed rpm : 1160

travel mm : 8.10...8.30

5th speed rpm : 1210

travel mm : 9.40...9.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1180

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 167.0...169.0

1000 : (164.0...172.0)

Spread cm³ : 4.00

1000 : (7.50)

RATED SPEED

1st version
Control lever
position degrees: 115...123

Testing:
1st rack travel in: 11.30
Speed rpm : 1160...1170
2nd rack travel in: 4.00
Speed rpm : 1220...1250
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 60...68

Testing:
Speed rpm : 100
Minimum rack trave: 5.30
Speed rpm : 250
Rack travel in mm : 3.90...4.10

CONSTANT REGULATION
Speed rpm : 270...380

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 12.30...12.40

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.80...10.00
2nd pressure hPa : 610
Rack travel in m: 12.10...12.20
3rd pressure hPa : 280
Rack travel in m: 10.10...10.30

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: -
Speed rpm : 700
Del.quantity cm³/ : 121.0...124.0
1000 s: (118.0...127.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 11.30
Speed rpm : 1160...1170

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 160.0...190.0
1000 s: (156.0...196.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 250
Rack travel in mm : 3.90...4.10
Del.quantity cm³/ : 15.0...19.0
1000 s: (12.5...21.5)
Spread cm³ : 3.00
1000 s: (6.00)

Remarks:

:
Delivery-valve spring pre-tension =
2.40...2.60 mm.
Permissible alteration from 2.20...2.90
mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,0 x
 Edition : 05.11.90
 Replaces : 2.2.90
 Test oil : ISO-4113

Combination no. : 0 401 846 910

Injection pump
 Pump designation : PE6P110A320LS3851
 EP type number : 0 411 816 765
 Governor
 Governor design. : RQ300/1050PA187-26
 Governor no. : 0 421 801 489

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM441

1st version kW : 160.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50
 : (4.35...4.55)
 Rack travel in mm : 9.00...12.00
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 10.90...11.00

Del.quantity cm³/ : 12.2...12.4

100 s: (11.9...12.6)

Spread cm³ : 0.8

100 s: (1.3)

2nd speed rpm : 300.0

Rack travel in mm : 6.3...6.9

Del.quantity cm³/ : 1.6...2.2

100 s: (1.3...2.4)

Spread cm³ : 0.6

100 s: (1.1)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 650

Rack travel in mm : 13.10...13.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Del.quantity : 122.0...124.0

1000 : (119.5...126.5)

Spread cm³ : 8.50

1000 : (13.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 650

Rack travel in mm : 13.5

Testing:

1st rack travel in: 9.90
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1175...1205
4th rack travel in: 1300
Speed rpm : 0.00...2.00

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.6

Testing:

Speed rpm : 200
Minimum rack trave: 8.20
Speed rpm : 300
Rack travel in mm : 6.30...6.90
Rack travel in mm : 2.00
Speed rpm : 390...430

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600
Del.quantity cm³/ : 119.0...125.0
1000 s: (119.0...125.0)
Spread cm³ : 11.00
1000 s: (14.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.90
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 130.0...150.0
1000 s: (126.0...154.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,0 W
 Edition : 05.11.90
 Replaces : 12.4.90
 Test oil : ISO-4113

Combination no. : 0 401 846 918

Injection pump
 Pump designation : PE6P110A320LS3851
 EP type number : 0 411 816 765
 Governor
 Governor design. : RQV300...1050PA884-6
 Governor no. : 0 421 813 832

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM441

1st version kW : 160.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50
 : (4.35...4.55)
 Rack travel in mm : 9.00...12.00
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 10.90...11.00

Del.quantity cm³/ : 12.2...12.4

100 s: (11.9...12.6)

Spread cm³ : 0.8

100 s: (1.3)

2nd speed rpm : 300.0

Rack travel in mm : 6.3...6.9

Del.quantity cm³/ : 1.6...2.2

100 s: (1.3...2.4)

Spread cm³ : 0.6

100 s: (1.1)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed	rpm	: 300
travel mm		: 1.00...1.50
2nd speed	rpm	: 440
travel mm		: 2.70...3.20
3rd speed	rpm	: 730
travel mm		: 4.70...5.20
4th speed	rpm	: 1110
travel mm		: 8.00...8.50
5th speed	rpm	: 1360
travel mm		: 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1100

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1050
Del.quantity cm³/ 1000 s : 122.0...124.0
1000 s : (119.5...126.5)
Spread cm³ : 8.50
1000 : (13.00)

Del.quantity cm³/ : 130.0...150.0
1000 s: (126.0...154.0)

Remarks:

:

RATED SPEED

1st version
Control lever
position degrees: 114...122

Testing:

1st rack travel in: 9.90
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1180...1210
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 83...91

Testing:

Speed rpm : 200
Minimum rack trave: 8.20
Speed rpm : 300
Rack travel in mm : 6.30...6.90
Rack travel in mm : 2.00
Speed rpm : 300...500

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 600
Del.quantity cm³/ 1000 s : 119.0...125.0
1000 s: (119.0...125.0)
Spread cm³ : 11.00
1000 s: (14.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 9.90
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : VOL 10,2 a
 Edition : 19.10.90
 Replaces : -
 Test oil : ISO-4113

Combination no. : 0 401 846 935

Injection pump
 Pump designation : PE6P120A320RS3262
 EP type number : 0 411 826 797
 Governor
 Governor design. : RQV300..1050PA232-4
 Governor no. : 0 421 813 883

Customer-spec. information
 Customer : VME

Engine : TD102 GC

1st version kW : 180.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder assembly : 1 688 901 019

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness x Length mm : 6.00x1.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60
 : (3.45...3.65)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 9.20...9.30

Del.quantity cm³/ : 16.9...17.1

100 s: (16.6...17.4)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.3...5.5

Del.quantity cm³/ : 3.2...3.7

100 s: (2.9...3.9)

Spread cm³ : 0.5

100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed	rpm	: 300
travel mm		: 1.30...1.70
2nd speed	rpm	: 500
travel mm		: 2.70...3.30
3rd speed	rpm	: 800
travel mm		: 4.90...5.50
4th speed	rpm	: 1100
travel mm		: 7.60...7.70
5th speed	rpm	: 1180
travel mm		: 8.80...9.20

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1150

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 169.0...171.0
1000 : (166.0...174.0)
Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 108...116

Testing:
1st rack travel in: 8.20
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1150...1180
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 80...88

Testing:
Speed rpm : 100
Minimum rack trave: 6.90
Speed rpm : 300
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION
Speed rpm : 300...440

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 9.20...9.30

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 8.80...9.00
2nd pressure hPa : 160
Rack travel in m: 9.10...9.20

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: -
Speed rpm : 700
Del.quantity cm³/ : 164.0...166.0
1000 s: (161.0...169.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 8.20
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 260.0...290.0
1000 s: (256.0...294.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 300
Rack travel in mm : 5.30...5.50
Del.quantity cm³/ : 32.0...37.0
1000 s: (29.5...39.5)
Spread cm³ : 5.00
1000 s: (7.00)

Remarks:
:

Delivery-valve spring pre-tension =
2.40...2.60 mm.
Permissible alteration from 2.20...2.90
mm

APPLICATION

Loading machine

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 14,7 l 2
 Edition : 05.11.90
 Replaces : 12.4.90
 Test oil : ISO-4113

Combination no. : 0 401 848 805

Injection pump
 Pump designation : PE8P110A320LS3846-1
 EP type number : 0 411 818 719
 Governor
 Governor design. : RQ300/1050PA187-27
 Governor no. : 0 421 801 488

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : OM442

1st version kW : 195.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50
 : (4.35...4.55)
 Rack travel in mm : 9.00...12.00
 Firing order : 8- 7- 2- 6- 3- 5-
 4- 1

Phasing : 0-45-90-135-180-225-
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 10.90...11.00

Del.quantity cm³/ : 11.1...11.3

100 s: (10.8...11.5)

Spread cm³ : 0.8

100 s: (1.3)

2nd speed rpm : 300.0

Rack travel in mm : 7.0...7.6

Del.quantity cm³/ : 1.6...2.2

100 s: (1.3...2.4)

Spread cm³ : 0.6

100 s: (1.1)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 650

Rack travel in mm : 13.10...13.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Del.quantity : 111.0...113.0

1000 : (108.5...115.5)

Spread cm³ : 8.50

1000 : (13.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 650

Rack travel in mm : 13.5

Testing:

1st rack travel in: 9.90
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1170...1200
4th rack travel in: 1300
Speed rpm : 0.00...2.00

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 7.3

Testing:

Speed rpm : 200
Minimum rack trave: 9.20
Speed rpm : 300
Rack travel in mm : 7.00...7.60
Rack travel in mm : 2.00
Speed rpm : 400...440

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600
Del.quantity cm³/ : 106.0...112.0
1000 s: (103.5...114.5)
Spread cm³ : 11.00
1000 s: (14.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.90
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 130.0...150.0
1000 s: (126.0...154.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 14,7 L 3
 Edition : 05.11.90
 Replaces : 2.1.90
 Test oil : ISO-4113

 Combination no. : 0 401 848 806

 Injection pump
 Pump designation : PE8P110A320LS3846-1
 EP type number : 0 411 818 719
 Governor
 Governor design. : RQ300/1050PA187-28
 Governor no. : 0 421 801 492

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM442

 1st version kW : 213.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm	: 4.40...4.50
	: (4.35...4.55)
Rack travel in mm	: 9.00...12.00
Firing order	: 8- 7- 2- 6- 3- 5- 4- 1

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 10.90...11.00

Del.quantity cm³/ : 12.2...12.4

100 s: (11.9...12.6)

Spread cm³ : 0.8

100 s: (1.3)

2nd speed rpm : 300.0

Rack travel in mm : 6.3...6.9

Del.quantity cm³/ : 1.6...2.2

100 s: (1.3...2.4)

Spread cm³ : 0.6

100 s: (1.1)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 650

Rack travel in mm : 13.10...13.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Del.quantity : 122.0...124.0

1000 : (119.5...126.5)

Spread cm³ : 8.50

1000 : (13.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 650

Rack travel in mm : 13.5

Testing:

1st rack travel in: 9.90
Speed rpm : 1080...1090
2nd rack travel in: 4.00
Speed rpm : 1160...1190
4th rack travel in: 1300
Speed rpm : 0.00...2.00

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.6

Testing:

Speed rpm : 200
Minimum rack trave: 8.20
Speed rpm : 300
Rack travel in mm : 6.30...6.90
Rack travel in mm : 2.00
Speed rpm : 390...430

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 300
Del.quantity cm³/ : 119.0...125.0
1000 s: (119.0...125.0)
Spread cm³ : 11.00
1000 s: (14.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.90
Speed rpm : 1080...1090

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 130.0...150.0
1000 s: (126.0...154.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 14,7 r
 Edition : 05.11.90
 Replaces : 20.7.90
 Test oil : ISO-4113

Combination no. : 0 401 848 808

Injection pump
 Pump designation : PE8P110A320LS3846-1
 EP type number : 0 411 818 719
 Governor
 Governor design. : RQV300...1050PA884-5
 Governor no. : 0 421 813 831

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : OM442

1st version kW : 213.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50
 : (4.35...4.55)
 Rack travel in mm : 9.00...12.00
 Firing order : 8- 7- 2- 6- 3- 5-
 4- 1

Phasing : 0-45-90-135-180-225-
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 10.90...11.00

Del.quantity cm³/ : 12.2...12.4

100 s: (11.9...12.6)

Spread cm³ : 0.8

100 s: (1.3)

2nd speed rpm : 300.0

Rack travel in mm : 6.3...6.9

Del.quantity cm³/ : 1.6...2.2

100 s: (1.3...2.4)

Spread cm³ : 0.6

100 s: (1.1)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed	rpm	: 300
travel mm		: 1.00...1.50
2nd speed	rpm	: 440
travel mm		: 2.70...3.20
3rd speed	rpm	: 730
travel mm		: 4.70...5.20
4th speed	rpm	: 1110
travel mm		: 8.00...8.50
5th speed	rpm	: 1360
travel mm		: 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1100

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1050
Del.quantity cm³/ 1000 : 122.0...124.0
1000 s: (119.5...126.5)
Spread cm³ 1000 : 8.50
1000 s: (13.00)

RATED SPEED

1st version
Control lever
position degrees: 116...124

Testing:

1st rack travel in: 9.90
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1180...1210
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 85...93

Testing:

Speed rpm : 200
Minimum rack trave: 8.50
Speed rpm : 300
Rack travel in mm : 6.30...6.90

CONSTANT REGULATION

Speed rpm : 300...500

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 600
Del.quantity cm³/ 1000 s: 119.0...125.0
1000 s: (119.0...125.0)
Spread cm³ 1000 s: 11.00
1000 s: (14.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 9.90
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ 1000 s: 130.0...150.0
1000 s: (126.0...154.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 14,7 r 1
 Edition : 05.11.90
 Replaces : 19.6.90
 Test oil : ISO-4113

Combination no. : 0 401 848 810

Injection pump
 Pump designation : PE8P110A320LS3846-1
 EP type number : 0 411 818 719
 Governor
 Governor design. : RQV300...1050PA884-7
 Governor no. : 0 421 813 859

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM442

1st version kW : 195.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50
 : (4.35...4.55)
 Rack travel in mm : 9.00...12.00
 Firing order : 8- 7- 2- 6- 3- 5-
 4- 1

Phasing : 0-45-90-135-180-225-
 270-315
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 10.90...11.00

Del.quantity cm³/ : 11.1...11.3
 100 s: (10.8...11.5)

Spread cm³ : 0.8
 100 s: (1.3)

2nd speed rpm : 300.0
 Rack travel in mm : 7.0...7.6
 Del.quantity cm³/ : 1.6...2.2
 100 s: (1.3...2.4)
 Spread cm³ : 0.6
 100 s: (1.1)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed	rpm	: 300
	travel mm	: 1.00...1.40
2nd speed	rpm	: 480
	travel mm	: 3.10...3.60
3rd speed	rpm	: 770
	travel mm	: 5.60...6.10
4th speed	rpm	: 1100
	travel mm	: 8.70...9.20
5th speed	rpm	: 1310
	travel mm	: 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1100
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1050
Del.quantity cm³/ : 111.0...113.0
1000 : (108.5...115.5)
Spread cm³ : 8.50
1000 : (13.00)

Speed rpm : 100
Del.quantity cm³/ : 130.0...150.0
1000 s: (126.0...154.0)

Remarks:

RATED SPEED

1st version
Control lever
position degrees: 116...124

Testing:

1st rack travel in: 9.90
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1180...1210
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 25...93

Testing:

Speed rpm : 200
Minimum rack trav: 8.90
Speed rpm : 300
Rack travel in mm : 7.00...7.60

CONSTANT REGULATION

Speed rpm : 300...500

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 600
Del.quantity cm³/ : 106.0...112.0
1000 s: (103.5...114.5)
Spread cm³ : 11.00
1000 s: (14.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 9.90
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM 10,8 a2
 Edition : 17.10.90
 Replaces : 6.4.88
 Test oil : ISO-4113

 Combination no. : 0 401 876 334

 Injection pump
 Pump designation : PE6P120A320RS468
 EP type number : 0 411 826 128
 Governor
 Governor design. : RSUV300...900POA320
 -1
 Governor no. : 0 421 829 107

 Customer-spec. information
 Customer : MWM

 Engine : D-TBD 234 V6

 1st version kW : 300.0
 Rated speed : 1800

TEST BENCH REQUIREMENTS

 Test oil
 inlet temp. °C : 38...42

 Overflow valve : 1 417 413 025

 Inlet press., bar : 1.50

 Test nozzle holder assembly : 1 688 901 019

 Opening pressure, bar : 207...210

 Orifice plate diameter mm : 0,8

 Test Lines : 1 680 750 067

 Outside diameter x Wall thickness x Length mm : 6.00X1.50X1000

 (A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...2.95)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 6- 3- 2- 5- 4

 Phasing : 0-90-120-210-240-330

 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

 1st speed rpm : 750

 Rack travel in mm : 13.70...13.80

 Del.quantity cm³/ : 24.9...25.1

 100 s: (24.6...25.4)

 Spread cm³ : 0.5

 100 s: (0.9)

 2nd speed rpm : 300.0
 Rack travel in mm : 5.5...5.7
 Del.quantity cm³/ : 2.0...2.6
 100 s: (1.7...2.9)
 Spread cm³ : 0.8
 100 s: (1.2)

GUIDE SLEEVE POSITION
 Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...0.70

 Governor spring pre-tension
 Click setting x : 3.75

FULL LOAD DELIV. AT FULL LOAD STOP

 1st version
 Speed rpm : 750
 Del.quantity : 249.0...251.0
 1000 : (246.0...254.0)
 Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

 1st version
 Control lever
 position degrees: 116...124

 Testing:
 1st rack travel in: 12.70
 Speed rpm : 940...950

2nd rack travel in: 4.00
Speed rpm : 965...995
4th rack travel in: 1130
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 72...80
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.1
Speed rpm : 300
Rack travel in mm : 5.50...5.70
Rack travel in mm : 2.00
Speed rpm : 320...380

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 900
Rack travel in m: 13.70...13.80
2nd speed rpm : 450
Rack travel in m: 13.70...13.80
3rd speed rpm : 280
Rack travel in m: 14.90...15.50

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 12.70
Speed rpm : 940...950

LOW IDLE

Speed rpm : 300
Rack travel in mm : 5.50...5.70
Del.quantity cm³/ : 20.0...26.0
1000 s: (17.0...29.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : VOL 12.2 c1
 Edition : 05.11.90
 Replaces : -
 Test oil : ISO-4113

Combination no. : 0 401 876 776

Injection pump
 Pump designation : PE6P120A320RS3206-2
 EP type number : 0 411 826 784
 Governor
 Governor design. : RSV250...900P4A374-10
 Governor no. : 0 421 833 345

Customer-spec. information
 Customer : VOLVO-TRUCK

Engine : TID 121 LP

1st version kW : 295.0
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder assembly : 1 688 901 019

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness x Length mm : 6.00x1.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60
 : (3.45...3.65)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.00...12.10

Del.quantity cm³/ : 29.8...30.0

100 s: (29.5...30.3)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 5.3...5.5

Del.quantity cm³/ : 2.3...2.9

100 s: (2.0...3.2)

Spread cm³ : 0.5

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.40

Governor spring pre-tension

Click setting x : 3.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 1500

Del.quantity : 298.0...300.0

1000 : (295.0...303.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 98...106

Testing:	Speed rpm : 100
1st rack travel in: 11.00	Del.quantity cm ³ / : 265.0...295.0
Speed rpm : 945...955	1000 s: (261.0...299.0)
2nd rack travel in: 4.00	Rack travel in mm : 20.00...21.00
Speed rpm : 970...1000	
3rd rack travel in: 4.00	Remarks:
Speed rpm : 985...1015	:
4th rack travel in: 1150	Delivery-valve spring pre-tension =
Speed rpm : 0.30...1.40	2.40...2.60 mm.
LOW IDLE 1	Permissible alteration from 2.20...2.90
Control lever	mm
position degrees: 48...56	
Setting point w/out bumper spring	
Speed rpm : 250	
Rack travel in mm : 4.9	
Speed rpm : 250	
Rack travel in mm : 5.30...5.50	
Rack travel in mm : 2.00	
Speed rpm : 380...440	
Aneroid/Altitude Compensator Test	
1st version	
Setting	
Speed rpm : 500	
Pressure hPa : 1500	
Rack travel mm : 12.00...12.10	
Measurement	
Speed 1/min : 500	
1st pressure hPa : -	
Rack travel in m: 7.10...7.30	
2nd pressure hPa : 1000	
Rack travel in m: 11.50...11.60	
FUEL DELIVERY CHARACTERISTICS	
1st version	
Aneroid pressure h: -	
Speed rpm : 700	
Del.quantity cm ³ / : 135.5...137.5	
1000 s: (132.5...140.5)	
BREAKAWAY	
1st version	
1mm rack travel less than	
full load rack tr: 11.00	
Speed rpm : 945...955	
STARTING FUEL DELIVERY	

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : PEN 12,2 b3
 Edition : 05.11.90
 Replaces : -
 Test oil : ISO-4113

 Combination no. : 0 401 876 777

 Injection pump
 Pump designation : PE6P120A320RS3261
 EP type number : 0 411 826 796
 Governor
 Governor design. : RSV250...1100POA374-
 11
 Governor no. : 0 421 833 346

 Customer-spec. information
 Customer : PENTA

 Engine : TAMD 102

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

 Overflow valve : 1 417 413 025

 Inlet press., bar : 1.50

 Test nozzle holder assembly : 1 688 901 019

 Opening pressure, bar : 207...210

 Orifice plate diameter mm : 0,8

 Test Lines : 1 680 750 067

 Outside diameter x Wall thickness x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 12.20...12.30

Del.quantity cm³/ : 25.8...26.0

100 s: (25.5...26.3)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : ?

Del.quantity cm³/ : 2.0...2.6

100 s: (1.7...2.9)

Spread cm³ : 0.5

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.40

Governor spring pre-tension

Click setting x : 2.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 1500

Del.quantity : 258.0...260.0

1000 : (255.0...263.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 91...99

Testing:

1st rack travel in: 11.20

Speed rpm : 1120...1130

2nd rack travel in: 4.00
Speed rpm : 1170...1200
3rd rack travel in: 4.00
Speed rpm : 1185...1215
4th rack travel in: 1350
Speed rpm : 0.30...1.40

LOW IDLE 1
Control lever
position degrees: 41...49
Setting point w/out bumper spring
Speed rpm : 250
Rack travel in mm : 4.7
Speed rpm : 250
Rack travel in mm : 5.10...5.30
Rack travel in mm : 2.00
Speed rpm : 390...450

Aneroid/Altitude Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 1500
Rack travel mm : 12.20...12.30

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 8.60...8.80
2nd pressure hPa : 270
Rack travel in m: 9.00...9.10
3rd pressure hPa : 1000
Rack travel in m: 11.80...12.00

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: -
Speed rpm : 900
Del.quantity cm³/ : 163.0...165.0
1000 s: (160.0...168.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.20
Speed rpm : 1120...1130

STARTING FUEL DELIVERY

Speed rpm : 100

LOW IDLE

Speed rpm : 250
Rack travel in mm : 5.10...5.30

Remarks:

:

Delivery-valve spring pre-tension =
2.40...2.60 mm.
Permissible alteration from 2.20...2.90
mm

APPLICATION

Navy

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,1 a
 Edition : 17.10.90
 Replaces : -
 Test oil : ISO-4113

Combination no. : 0 401 876 779

Injection pump
 Pump designation : PE6P110A320LS3835-2
 EP type number : 0 411 816 761
 Governor
 Governor design. : RSV675...1025P0A820-
 11
 Governor no. : 0 421 833 347

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM 441

1st version kW : 164.0
 Rated speed : 2050

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10
 : (3.95...4.15)
 Rack travel in mm : 9.00...12.00
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.00...13.10

Del.quantity cm³/ : 13.8...14.0

100 s: (13.5...14.2)

Spread cm³ : 0.4

100 s: (0.8)

2nd speed rpm : 675.0

Rack travel in mm : 3.4...4.0

Del.quantity cm³/ : 1.2...1.8

100 s: (0.9...2.0)

Spread cm³ : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 138.0...140.0

1000 : (135.5...142.5)

Spread cm³ : 4.00

1000 : (8.00)

RATED SPEED

1st version

Control lever

position degrees: 85...93

Testing:

1st rack travel in: 12.00
Speed rpm : 1035...1045
2nd rack travel in: 4.00
Speed rpm : 1065...1083
4th rack travel in: 13.00
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 70...78
Setting point w/out bumper spring
Speed rpm : 675
Rack travel in mm : 3.7

Testing:

Speed rpm : 100
Minimum rack trave: 19.50
Speed rpm : 675
Rack travel in mm : 3.40...4.00
Rack travel in mm : 2.00
Speed rpm : 680...720

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 700
Del.quantity cm³/ : 135.0...139.0
1000 s: (132.0...142.0)
Spread cm³ : 6.00
1000 s: (8.00)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 12.00
Speed rpm : 1035...0

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 140.0...160.0
1000 s: (136.0...164.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 11,9a44
 Edition : 05.11.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 036 083
 Injection pump
 Pump designation : PES6P120A720/3LS470-
 EP type number : 0 412 026 050
 Governor
 Governor design. : RQ300/950PA813-17
 Governor no. : 0 421 801 546

Customer-spec. information

Customer : MAN
 Engine : D2866 LF 07

1st version kW : 213.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 2.80...2.90
 : (2.75...2.95)
 Rack travel in mm : 9.00...12.00
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 750

Rack travel in mm : 10.20...10.30

Del.quantity cm³/

100 s: (18.0...18.8)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.7...4.9

Del.quantity cm³/

100 s: (0.9...2.1)

Spread cm³ : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Aneroid pressure h:

1000 : 1000 : 183.0...185.0

1000 : (180.0...188.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 8.80
Speed rpm : 995...1010
2nd rack travel in: 4.00
Speed rpm : 1020...1150
4th rack travel in: 1250
Speed rpm : 0.00...1.00

LOW IDLE 1
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 4.8

Testing:
Speed rpm : 100
Minimum rack trave: 6.30
Speed rpm : 300
Rack travel in mm : 4.70...4.90
Rack travel in mm : 2.00
Speed rpm : 355...395

TORQUE CONTROL
Dimension a mm : 0.30
Torque control curve - 1st version
1st speed rpm : 950
Rack travel in m: 9.80...9.90
2nd speed rpm : 750
Rack travel in m: 10.50...10.70
3rd speed rpm : 850
Rack travel in m: 10.10...10.30

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 1000
Rack travel mm : 10.20...10.30

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 8.90...9.10
2nd pressure hPa : 85
Rack travel in m: 9.30...9.40
3rd pressure hPa : 160
Rack travel in m: 9.70...10.00

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1000
Speed rpm : 950

Del.quantity cm3/ : 181.0...185.0
1000 s: (178.0...188.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 132.0...134.0
1000 s: (129.0...137.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 8.80
Speed rpm : 995...1010

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 225.0...245.0
1000 s: (221.0...249.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 4.70...4.90
Del.quantity cm3/ : 12.0...18.0
1000 s: (9.0...21.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:
: MAN-NR. 3-7086

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 6
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI 9,8 a 3
 Edition : 05.11.90
 Replaces : 1.2.90
 Test oil : ISO-4113
 Combination no. : 0 402 046 300

Injection pump
 Pump designation : PES6P120A320RS419
 EP type number : 0 412 026 037
 Governor
 Governor design. : RQV275...1100PA495-5
 Governer no. : 0 421 813 446

Customer-spec. information
 Customer : RVI

 Engine : MIDR 062045

 1st version kW : 191.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

 Test oil
 inlet temp. °C : 38...42

 Overflow valve : 1 417 413 025

 Inlet press., bar : 1.50

 Test nozzle holder assembly : 1 688 901 019

 Opening pressure, bar : 207...210

 Orifice plate diameter mm : 0,8

 Test lines : 1 680 750 075

 Outside diameter x Wall thickness x Length mm : 8.00x2.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...2.95)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 9.00...9.10

Del.quantity cm³/ : 16.2...16.4

100 s: (15.9...16.7)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 4.0...4.4

Del.quantity cm³/ : 1.9...2.5

100 s: (1.6...2.8)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250
 travel mm : 1.00...1.20
 2nd speed rpm : 450
 travel mm : 3.40...3.80
 3rd speed rpm : 850
 travel mm : 6.10...6.30
 4th speed rpm : 1100
 travel mm : 8.00...8.20

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1150

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 700

Del.quantity 1000 : 162.0...164.0

1000 : (159.0...167.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 117...125

Testing:

1st rack travel in: 8.00
Speed rpm : 1170...1180
2nd rack travel in: 4.00
Speed rpm : 1225...1255
4th rack travel in: 1350
Speed rpm : 0.00...8.00

LOW IDLE 1

Control lever

position degrees: 60...68

Testing:

Speed rpm : 200
Minimum rack trave: 6.50
Speed rpm : 275
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION

Speed rpm : 285...400

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : 700
Rack travel mm : 9.00...9.10

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 7.70...8.10

2nd pressure hPa : 220

Rack travel in m: 8.60...8.70

3rd pressure hPa : 195

Rack travel in m: 8.10...8.30

START CUT-OUT

Speed 1/min : 195 (215)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

Speed rpm : 700

Del.quantity cm³/ : 150.0...156.0
1000 s: (147.0...159.0)

Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 102.0...104.0
1000 s: (99.0...107.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: -1.00
Speed rpm : 1170...1180

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 140.0...160.0
1000 s: (136.0...164.0)

LOW IDLE

Speed rpm : 275
Rack travel in mm : -4.00...-4.40
Del.quantity cm³/ : 19.0...25.0
1000 s: (16.0...28.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

:

Start-of-delivery mark 10.5° cam angle
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI 12,0 f1
 Edition : 05.11.90
 Replaces : 4.5.90
 Test oil : ISO-4113

Combination no. : 0 402 046 758

Injection pump
 Pump designation : PES6P120A320RS3139
 EP type number : 0 412 026 718
 Governor
 Governor design. : RQV275...950PA728-1
 Governor no. : 0 421 813 465

Customer-spec. information

Customer : RVI
 Engine : MIDR 063540

1st version kW : 243.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder assembly : 1 688 901 101

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,6

Test Lines : 1 680 750 015

Outside diameter x Wall thickness x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60
 : (3.45...3.65)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 12.50...12.60

Del.quantity cm³/

100 s: (19.4...20.2)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 5.20...5.60

Del.quantity cm³/ : 2.1...2.7

100 s: (1.8...3.0)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 275

travel mm : 1.30...1.70

2nd speed rpm : 450

travel mm : 3.30...3.70

3rd speed rpm : 800

travel mm : 5.60...6.00

4th speed rpm : 950

travel mm : 6.70...6.90

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1125

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1000

Del.quantity : 197.0...199.0

1000 : (194.0...202.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 115...123

Testing:

1st rack travel in: 11.50
Speed rpm : 1020...1030
2nd rack travel in: 4.00
Speed rpm : 1155...1185
4th rack travel in: 1250
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 64...72

Testing:

Speed rpm : 200
Minimum rack trave: 7.10
Speed rpm : 275
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION

Speed rpm : 300...400

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : 1000
Rack travel mm : 12.50...12.60

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 9.00...9.40

2nd pressure hPa : 520

Rack travel in m: 11.80...11.90

3rd pressure hPa : 200

Rack travel in m: 10.10...10.40

START CUT-OUT

Speed 1/min : 195 (215)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000
Speed rpm : 950
Del.quantity cm³/ : 196.0...202.0
1000 s: (193.0...205.0)

Aneroid pressure h: -

Speed rpm : 500
Del.quantity cm³/ : 117.0...119.0
1000 s: (114.0...122.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: -1.00
Speed rpm : 1020...1030

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 155.0...185.0
1000 s: (151.0...189.0)

LOW IDLE

Speed rpm : 275
Rack travel in mm : -6.90...-7.30
Del.quantity cm³/ : 21.0...27.0
1000 s: (18.0...30.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

:

Start-of-delivery mark 9° cam angle
after start of delivery cyl. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI 12,0 f2
 Edition : 05.11.90
 Replaces : 4.5.90
 Test oil : ISO-4113

 Combination no. : 0 402 046 791

 Injection pump
 Pump designation : PES6P120A320RS3139
 EP type number : 0 412 026 718
 Governor
 Governor design. : RQV275...950PA728-4
 Governor no. : 0 421 813 678

 Customer-spec. information
 Customer : RVI

 Engine : MIDR 063540 H

 1st version kW : 264.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

 Overflow valve : 1 417 413 025

 Inlet press., bar : 1.50

 Test nozzle holder assembly : 1 688 901 101

 Opening pressure, bar : 207...210

 Orifice plate diameter mm : 0,6

 Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60
 : (3.45...3.65)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.30...13.40

Del.quantity cm³/ : 21.2...21.4

100 s: (20.9...21.7)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 5.60...6.00

Del.quantity cm³/ : 2.3...2.9

100 s: (2.0...3.2)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed	rpm	: 275
travel mm		: 1.30...1.70
2nd speed	rpm	: 450
travel mm		: 3.30...3.70
3rd speed	rpm	: 800
travel mm		: 5.60...6.00
4th speed	rpm	: 950
travel mm		: 6.70...6.90
5th speed	rpm	: 1500
travel mm		: 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1125

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1000

Del.quantity : 212.0...214.0

1000 : (209.0...217.0)

Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 118...126

Testing:

1st rack travel in: 12.30
Speed rpm : 1015...1025
2nd rack travel in: 4.00
Speed rpm : 1160...1190
4th rack travel in: 1250
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 65...73

Testing:

Speed rpm : 200
Minimum rack trave: 7.60
Speed rpm : 275
Rack travel in mm : 5.70...5.90

CONSTANT REGULATION

Speed rpm : 295...400

Aneroid/Altitude Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 1000
Rack travel mm : 13.30...13.40

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.20...9.50
2nd pressure hPa : 660
Rack travel in m: 12.60...12.70
3rd pressure hPa : 200
Rack travel in m: 10.20...10.40

START CUT-OUT

Speed 1/min : 195 (215)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1000
Speed rpm : 950

Del.quantity cm³/ : 210.0...216.0
 1000 s: (207.0...219.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 117.0...119.0
 1000 s: (114.0...122.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: -1.00
Speed rpm : 1015...1025

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 150.0...180.0
 1000 s: (146.0...184.0)

LOW IDLE

Speed rpm : 275
Rack travel in mm : -7.30...-7.70
Del.quantity cm³/ : 23.0...29.0
 1000 s: (20.0...32.0)
Spread cm³ : 8.00
 1000 s: (12.00)

Remarks:

:
Start-of-delivery mark 9° cam angle
after start of delivery cyl. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 21,9 v 3
 Edition : 17.10.90
 Replaces : -
 Test oil : ISO-4113

 Combination no. : 0 402 640 807A

 Injection pump
 Pump designation : PE12P120A320LS7806
 EP type number : 0 412 620 805
 Governor
 Governor design. : RQV400...1065PA835-2
 Governer no. : 0 421 813 603

 Customer-spec. information
 Customer : MERCEDES-BENZ

 Engine : OM 444 A

 1st version kW : 380.0
 Rated speed : 2130

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

 Overflow valve : 1 417 413 025

 Inlet press., bar : 1.50

 Overflow
 quantity min. 1/h: 150...170

 Test nozzle holder
 assembly : 1 688 901 019

 Opening
 pressure, bar : 207...210

 Orifice plate
 diameter mm : 0,8

 Test lines : 1 680 750 067

 Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm	: 4.00...4.10
	: (3.95...4.15)
Rack travel in mm	: 9.00...12.00
Firing order	: 12- 1- 5- 9- 8- 3- 4- 11- 10- 2- 6- 7

Phasing	: 0-45-60-105-120-165- 180-225-240-285-300- 345
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Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed	rpm : 600
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Rack travel in mm	: 13.70...13.90
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Del.quantity cm ³ /	: 19.7...20.0
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100 s:	(19.4...20.3)
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Spread	cm ³ : 0.5
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100 s:	(0.9)
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2nd speed	rpm : 400.0
Rack travel in mm	: 5.4...5.6
Del.quantity cm ³ /	: 1.6...2.2
100 s:	(1.3...2.5)

Spread	cm ³ : 0.8
100 s:	(1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed	rpm : 350
travel mm	: 1.00...1.20
2nd speed	rpm : 500
travel mm	: 3.10...3.30
3rd speed	rpm : 1100
travel mm	: 7.30...7.70
4th speed	rpm : 1225
travel mm	: 8.30...8.70

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed	rpm : 1180
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Rack travel in mm	: 15.20...17.80
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FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 600
 Aneroid pressure h: 700
 Del.quantity : 197.0...200.0
 1000 : (194.0...203.0)
 Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version
 Control lever
 position degrees: 112...120

Testing:
 1st rack travel in: 11.70
 Speed rpm : 1105...1115
 2nd rack travel in: 4.00
 Speed rpm : 1210...1240
 4th rack travel in: 1300
 Speed rpm : 0.00...1.00

LOW IDLE 1
 Control lever
 position degrees: 62...70

Testing:
 Speed rpm : 100
 Minimum rack trave: 6.10
 Speed rpm : 400
 Rack travel in mm : 4.40...4.60

CONSTANT REGULATION
 Speed rpm : 400...600

TORQUE CONTROL
 Dimension a mm : 1.60
 Torque control curve - 1st version
 1st speed rpm : 1065
 Rack travel in m: 12.70...12.90
 2nd speed rpm : 975
 Rack travel in m: 13.30...13.50
 3rd speed rpm : 900
 Rack travel in m: 13.90...14.10
 4th speed rpm : 800
 Rack travel in m: 14.30...14.50

Aneroid/Altitude
 Compensator Test

1st version
 Setting
 Speed rpm : 600
 Pressure hPa : 700
 Rack travel mm : 13.70...13.90

Measurement
 Speed 1/min : 600

1st pressure hPa : 350
 Rack travel in m: 11.30...11.50
 2nd pressure hPa : 500
 Rack travel in m: 12.60...12.80
 3rd pressure hPa : 950
 Rack travel in m: 14.10...14.20
 4th pressure hPa : 1100
 Rack travel in m: 14.20...14.40
 5th pressure hPa : -
 Rack travel in m: 10.90...11.10

START CUT-OUT

Speed 1/min : 270 (290)

FUEL DELIVERY CHARACTERISTICS

1st version
 Aneroid pressure h: 1100
 Speed rpm : 1065
 Del.quantity cm³/ : 184.0...188.0
 1000 s: (181.0...191.0)
 Spread cm³ : 8.00
 1000 s: (12.0)
 Aneroid pressure h: 1100
 Speed rpm : 800
 Del.quantity cm³/ : 212.0...216.0
 1000 s: (209.0...219.0)
 Spread cm³ : 8.00
 1000 s: (12.0)
 Aneroid pressure h: 1100
 Speed rpm : 1050
 Del.quantity cm³/ : 174.0...177.0
 1000 s: (171.0...180.0)
 Spread cm³ : 8.00
 1000 s: (12.0)
 Aneroid pressure h: -
 Speed rpm : 500
 Del.quantity cm³/ : 125.0...127.0
 1000 s: (122.0...130.0)
 Spread cm³ : 8.00
 1000 s: (12.0)

BREAKAWAY

1st version
 1mm rack travel less than
 full load rack tr: 11.70
 Speed rpm : 1105...1115

STARTING FUEL DELIVERY

Speed rpm : 100
 Del.quantity cm³/ : 190.0...210.0
 1000 s: (186.0...214.0)

Remarks:

:

APPLICATION

Rail car



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 22,0 c
 Edition : 24.10.90
 Replaces : 31.7.90
 Test oil : ISO-4113

Combination no. : 0 402 640 817

Injection pump
 Pump designation : PE12P120A520LS7826
 EP type number : 0 412 620 817
 Governor
 Governor design. : RQV350...1150PA870-4
 Governor no. : 0 421 813 717

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM 444 LA

1st version kW : 736.0
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 150...170

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50
 : (4.35...4.55)
 Rack travel in mm : 19.00...21.00
 Firing order : 12- 1- 5- 9- 8- 3-
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-
 180-225-240-285-300-
 345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 15.20...15.30

Del.quantity cm³/ : 31.2...31.4

100 s: (30.9...31.7)

Spread cm³ : 0.6

100 s: (1.0)

2nd speed rpm : 350.0
 Rack travel in mm : 5.3...5.9
 Del.quantity cm³/ : 1.6...2.2
 100 s: (1.3...2.5)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed	rpm	: 350
travel mm		: 1.30...1.80
2nd speed	rpm	: 600
travel mm		: 3.30...3.80
3rd speed	rpm	: 960
travel mm		: 5.30...5.80
4th speed	rpm	: 1206
travel mm		: 7.90...8.40
5th speed	rpm	: 1291
travel mm		: 9.80...10.30

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1275

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150
Aneroid pressure h: 1800
Del.quantity : 312.0...314.0
1000 : (309.0...317.0)
Spread cm³ : 6.00
1000 : (10.00)

RATED SPEED

1st version
Control lever
position degrees: 113...121

Testing:

1st rack travel in: 14.20
Speed rpm : 1190...1200
2nd rack travel in: 4.00
Speed rpm : 1270...1300
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 62...70

Testing:

Speed rpm : 250
Minimum rack trave: 7.30
Speed rpm : 350
Rack travel in mm : 5.30...5.90

CONSTANT REGULATION

Speed rpm : 350...600

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 8.20...8.50

Measurement

Speed 1/min : 500

1st pressure hPa : 300
Rack travel in m: 9.60...9.70
2nd pressure hPa : 1100
Rack travel in m: 13.80...14.10

START CUT-OUT

Speed 1/min : 310 (330)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1800
Speed rpm : 750
Del.quantity cm³/ : 303.0...313.0
1000 s: (300.0...316.0)
Spread cm³ : 10.00
1000 s: (15.0)

Aneroid pressure h: 1800
Speed rpm : 1150
Del.quantity cm³/ : 240.0...243.0 *
1000 s: (237.0...246.0)
Spread cm³ : 10.00
1000 s: (15.0)

Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 124.0...126.0
1000 s: (121.0...129.0)
Spread cm³ : 10.00
1000 s: (15.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 14.20
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 330.0...350.0
1000 s: (326.0...354.0)

Remarks:

:

* = Set at reduced-delivery stop.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 r
 Edition : 08.11.90
 Replaces : 5.10.90
 Test oil : ISO-4113

Combination no. : 0 402 736 807

Injection pump
 Pump designation : PES6P110A120RS7214
 EP type number : 0 412 716 805
 Governor
 Governor design. : RQV350...1100PA964-1
 Governor no. : 0 421 815 253

Customer-spec. information
 Customer : C.D.C.

Engine : 6CTA-A

1st version kW : 201.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 115...125

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45
 : (4.30...4.50)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 15.70...15.80

Del.quantity cm³/ : 20.6...20.8

100 s: (20.4...21.0)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.6...5.8

Del.quantity cm³/ : 2.8...3.2

100 s: (2.6...3.4)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

travel mm : 1.80...2.00

2nd speed rpm : 450

travel mm : 3.10...3.50

3rd speed rpm : 600

travel mm : 5.10...5.50

4th speed rpm : 1000

travel mm : 8.10...8.30

5th speed rpm : 1200

travel mm : 9.60...10.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 1500

Del.quantity : 206.0...208.0

1000 : (204.0...210.0)

Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 62...70

Testing:

1st rack travel in: 14.40
Speed rpm : 1145...1155
2nd rack travel in: 4.00
Speed rpm : 1310...1340
4th rack travel in: 1400
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 11...19

Testing:

Speed rpm : 275
Minimum rack trave: 7.20
Speed rpm : 350
Rack travel in mm : 5.60...5.80

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 1050
Rack travel in m: 15.70...15.80
2nd speed rpm : 650
Rack travel in m: 13.50...13.90
3rd speed rpm : 1100
Rack travel in m: 15.40...15.60

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 1050
Pressure hPa : 1500
Rack travel mm : 15.70...15.80

Measurement

Speed 1/min : 1050

1st pressure hPa : -
Rack travel in m: 8.20...8.60
2nd pressure hPa : 340
Rack travel in m: 10.20...10.30
3rd pressure hPa : 840
Rack travel in m: 13.60...14.00

START CUT-OUT

Speed 1/min : 290 (300)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1500
Speed rpm : 650
Del.quantity cm³/ : 198.5...202.5
1000 s: (196.5...204.5)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 98.0...102.0
1000 s: (96.0...104.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 14.40
Speed rpm : 1145...1155

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 160.0...180.0
1000 s: (155.0...185.0)
Rack travel in mm : 11.40...12.40

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.60...5.80
Del.quantity cm³/ : 28.0...32.0
1000 s: (26.0...34.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks: : C.D.C. # 3916627

Start-of-delivery mark = 5.5° after
start of delivery cyl. 1.

Bow dimension:
Sliding-sleeve position = 37.0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 5,9 w 1
 Edition : 08.11.90
 Replaces : 5.10.90
 Test oil : ISO-4113

Combination no. : 0 402 736 810

Injection pump
 Pump designation : PES6P110A120RS7213
 EP type number : 0 412 716 804
 Governor
 Governor design. : RQV400...1250PA964-2
 K
 Governer no. : 0 421 815 254

Customer-spec. information
 Customer : C.D.C.

Engine : 6BTA-A

1st version kW : 141.0
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 115...125

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45
 : (4.30...4.50)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 14.80...14.90

Del.quantity cm³/ : 15.9...16.1

100 s: (15.7...16.3)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 400.0

Rack travel in mm : 5.4...5.6

Del.quantity cm³/ : 3.3...3.7

100 s: (3.1...3.9)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 0.70...1.10

2nd speed rpm : 400

travel mm : 1.40...1.60

3rd speed rpm : 600

travel mm : 2.90...3.30

4th speed rpm : 1300

travel mm : 7.20...7.40

5th speed rpm : 1500

travel mm : 9.10...9.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Aneroid pressure h: 1200

Del.quantity : 159.0...161.0

1000 : (157.0...163.0)

Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version

Control lever
position degrees: 57...65

Testing:

1st rack travel in: 13.80
Speed rpm : 1295...1305
2nd rack travel in: 4.00
Speed rpm : 1455...1485
4th rack travel in: 1600
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 11...19

Testing:

Speed rpm : 275
Minimum rack trave: 7.20
Speed rpm : 400
Rack travel in mm : 5.40...5.60

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 1250
Rack travel in m: 14.80...14.90
2nd speed rpm : 800
Rack travel in m: 13.00...13.20

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 1250
Pressure hPa : 1200
Rack travel mm : 14.80...14.90

Measurement

Speed 1/min : 1250

1st pressure hPa : -
Rack travel in m: 8.20...8.60
2nd pressure hPa : 415
Rack travel in m: 10.20...10.30
3rd pressure hPa : 740
Rack travel in m: 13.00...13.40

START CUT-OUT

Speed 1/min : 290 (300)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 800
Del.quantity cm³/ : 159.0...163.0
1000 s: (157.0...165.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 95.5...99.5
1000 s: (93.5...101.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 13.80
Speed rpm : 1295...1305

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 155.0...175.0
1000 s: (150.0...180.0)
Rack travel in mm : 12.00...13.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 5.40...5.60
Del.quantity cm³/ : 33.0...37.0
1000 s: (31.0...39.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

: C.D.C. # 3919090

Start-of-delivery mark = 5.5° after
start of delivery cyl. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 r 1
 Edition : 08.11.90
 Replaces : 5.10.90
 Test oil : ISO-4113

Combination no. : 0 402 736 814

Injection pump
 Pump designation : PES6P110A120RS7214
 EP type number : 0 412 716 805
 Governor
 Governor design. : RQV350...1200PA964-6
 K
 Governor no. : 0 421 815 258

Customer-spec. information
 Customer : C.D.C.

Engine : 6CTA-A

1st version kW : 187.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 115...125

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45
 : (4.30...4.50)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 14.50...14.60

Del.quantity cm³/ : 18.3...18.5

100 s: (18.1...18.7)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.6...5.8

Del.quantity cm³/ : 2.8...3.2

100 s: (2.6...3.4)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

travel mm : 1.80...2.00

2nd speed rpm : 450

travel mm : 3.10...3.50

3rd speed rpm : 700

travel mm : 5.90...6.30

4th speed rpm : 1200

travel mm : 9.00...9.20

5th speed rpm : 1400

travel mm : 10.70...11.10

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 1200

Del.quantity : 183.0...185.0

1000 : (181.0...187.0)

Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 62...70

Testing:
1st rack travel in: 13.50
Speed rpm : 1245...1255
2nd rack travel in: 4.00
Speed rpm : 1405...1435
4th rack travel in: 1500
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 11...19

Testing:
Speed rpm : 275
Minimum rack trave: 7.20
Speed rpm : 350
Rack travel in mm : 5.60...5.80

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 1200
Rack travel in m: 14.50...14.60
2nd speed rpm : 650
Rack travel in m: 11.60...12.00

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 1200
Pressure hPa : 1200
Rack travel mm : 14.50...14.60

Measurement
Speed 1/min : 1200

1st pressure hPa : -
Rack travel in m: 7.70...8.10
2nd pressure hPa : 270
Rack travel in m: 9.50...9.60
3rd pressure hPa : 700
Rack travel in m: 12.60...13.00

START CUT-OUT

Speed 1/min : 265 (270)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 650
Del.quantity cm³/ : 168.5...172.5
1000 s: (166.5...174.5)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 90.0...94.0
1000 s: (88.0...96.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 13.50
Speed rpm : 1245...1255

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 140.0...160.0
1000 s: (135.0...165.0)
Rack travel in mm : 10.70...11.70

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.60...5.80
Del.quantity cm³/ : 28.0...32.0
1000 s: (26.0...34.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks: : C.D.C. # 3917089

Start-of-delivery mark = 5.5° after
start of delivery cyl. 1.

Bow dimension:
Sliding-sleeve position = 37.0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 r 2
 Edition : 08.11.90
 Replaces : 5.10.90
 Test oil : ISO-4113

Combination no. : 0 402 736 816

Injection pump
 Pump designation : PES6P110A120RS7214
 EP type number : 0 412 716 805
 Governor
 Governor design. : RQV350...1200PA964-8
 K
 Governor no. : 0 421 815 264

Customer-spec. information
 Customer : C.D.C.

Engine : 6CTA-A

1st version kW : 213.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 047

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 115...125

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45
 : (4.30...4.50)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 14.70...14.80

Del.quantity cm³/ : 19.0...19.2

100 s: (18.8...19.4)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.6...5.8

Del.quantity cm³/ : 2.8...3.2

100 s: (2.6...3.4)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

travel mm : 1.80...2.00

2nd speed rpm : 450

travel mm : 3.10...3.50

3rd speed rpm : 700

travel mm : 5.90...6.30

4th speed rpm : 1200

travel mm : 9.00...9.20

5th speed rpm : 1400

travel mm : 10.70...11.10

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 190.0...192.0

1000 : (188.0...194.0)

Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 62...70

Testing:
1st rack travel in: 13.20
Speed rpm : 1245...1255
2nd rack travel in: 4.00
Speed rpm : 1400...1430
4th rack travel in: 1500
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 11...19

Testing:
Speed rpm : 275
Minimum rack trave: 7.20
Speed rpm : 350
Rack travel in mm : 5.60...5.80

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 14.70...14.80
2nd speed rpm : 650
Rack travel in m: 12.50...12.90
3rd speed rpm : 1200
Rack travel in m: 14.20...14.40

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 1100
Pressure hPa : 1200
Rack travel mm : 14.70...14.80

Measurement
Speed 1/min : 1100
1st pressure hPa : -
Rack travel in m: 7.70...8.10
2nd pressure hPa : 260
Rack travel in m: 9.60...9.70
3rd pressure hPa : 710
Rack travel in m: 12.80...13.20

START CUT-OUT

Speed 1/min : 265 (270)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 650
Del.quantity cm³/ s: 182.0...186.0
1000 s: (180.0...188.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ s: 90.0...94.0
1000 s: (88.0...96.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 13.20
Speed rpm : 1245...1255

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ s: 140.0...160.0
1000 s: (135.0...165.0)
Rack travel in mm : 10.70...11.70

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.60...5.80
Del.quantity cm³/ s: 28.0...32.0
1000 s: (26.0...34.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks: : C.D.C # 3916626

Start-of-delivery mark = 5.5° after
start of delivery cyl. 1.

Bow dimension:
Sliding-sleeve position = 37.0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 21
 Edition : 21.09.90
 Replaces : 16.05.88
 Test oil : ISO-4113
 Combination no. : 0 403 446 187

Injection pump
 Pump designation : PES6MW100/720RS1129
 EP type number : 0 413 406 121
 Governor
 Governor design. : RQV300...1300MW50-2
 Governer no. : 0 420 083 124

Customer-spec. information
 Customer : DB
 Engine : OM 366 LA
 1st version kW : 150.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS
 Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 047
 Inlet press., bar : 1.50
 Test nozzle holder assembly : 0 681 343 009
 Opening pressure, bar : 172...175

 Test Lines : 1 680 750 015
 Outside diameter x Wall thickness x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32
 Prestroke mm : 3.70...3.80
 : (3.65...3.85)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

 Phasing : 0-60-120-180-240-300
 Tolerance + - * : 0.50 (0.75)

BASIC SETTING
 1st speed rpm : 1300
 Rack travel in mm : 11.20...11.30
 Del.quantity cm³/ : 9.8...10.0
 100 s: (9.6...10.2)
 Spread cm³ : 0.3
 100 s: (0.6)
 2nd speed rpm : 300.0
 Rack travel in mm : 5.5...5.6
 Del.quantity cm³/ : 0.9...1.1
 100 s: (0.6...1.4)
 Spread cm³ : 0.3
 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL
 1st speed rpm : 1340
 travel mm : 8.60...8.80
 2nd speed rpm : 1430
 travel mm : 9.30...9.70
 3rd speed rpm : 300
 travel mm : 1.20...1.60
 4th speed rpm : 700
 travel mm : 3.80...4.40

GUIDE SLEEVE POSITION
 Control-lever position
 Degree: -1
 Speed rpm : 1340
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP
 1st version
 Speed rpm : 1300
 Aneroid pressure h: 1000
 Del.quantity : 98.0...100.0
 1000 : (96.0...102.0)
 Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 116...124

Testing:

1st rack travel in: 10.20
Speed rpm : 1340...1350
2nd rack travel in: 4.00
Speed rpm : 1430...1460
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 51...59
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.5

Testing:

Speed rpm : 200
Minimum rack trave: 7.50
Speed rpm : 300
Rack travel in mm : 5.50...5.60

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

CONSTANT REGULATION

Speed rpm : 320...530

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 400
Rack travel mm : 9.90..10.00

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.50...9.60
2nd pressure hPa : 500
Rack travel in m: 10.80...11.10
3rd pressure hPa : 1000
Rack travel in m: 11.20...11.30

START CUT-OUT

Speed 1/min : 220 (230)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1000

Speed rpm : 600
Del.quantity cm³/ 1000 s: 83.5...86.5
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ 1000 s: 49.0...51.0
1000 s: (47.0...53.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.20
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ 1000 s: 88.0...98.0
1000 s: (85.0...101.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 5.50...5.60
Del.quantity cm³/ 1000 s: 9.0...11.0
Spread cm³ : 3.50
1000 s: (5.00)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC 7,6 V
 Edition : 05.11.90
 Replaces : 01.12.89
 Test oil : ISO-4113

Combination no. : 0 403 446 230

Injection pump
 Pump designation : PES6MW100/320RS1185
 EP type number : 0 413 406 170
 Governor
 Governor design. : RQV350...1200MW64-2
 Governer no. : 0 420 083 194

Customer-spec. information
 Customer : NAVISTAR

Engine : DTA-466

1st version kW : 201.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 3.75...3.85
 : (3.70...3.90)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 14.00...14.10

Del.quantity cm³/ : 14.2...14.4

100 s: (14.0...14.6)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.0...6.2

Del.quantity cm³/ : 1.4...1.8

100 s: (1.1...2.0)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 8.30...8.50

2nd speed rpm : 1460

travel mm : 9.10...9.50

3rd speed rpm : 550

travel mm : 3.10...3.70

4th speed rpm : 350

travel mm : 1.30...1.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 800

Del.quantity : 142.5...144.5

1000 : (140.5...146.5)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 42...50

Testing:

1st rack travel in: 13.00
Speed rpm : 1265...1285
2nd rack travel in: 4.00
Speed rpm : 1415...1425
4th rack travel in: 1500
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 9...17
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 6.1

Testing:

Speed rpm : 100
Minimum rack trave: 9.00
Speed rpm : 350
Rack travel in mm : 6.00...6.20

CONSTANT REGULATION

Speed rpm : 360...450

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1200
Rack travel in m: 14.00...14.10
2nd speed rpm : 800
Rack travel in m: 14.40...14.60
3rd speed rpm : 1150
Rack travel in m: 14.10...14.30

Aneroid/Altitude

Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 265
Rack travel mm : 11.50...11.60

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.60...10.70
2nd pressure hPa : 480
Rack travel in m: 13.30...13.60
3rd pressure hPa : 800
Rack travel in m: 14.40...14.60

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 800
Speed rpm : 800
Del.quantity cm³/ 1000 s: 151.0...155.0
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ 1000 s: 83.5...85.5
1000 s: (81.5...87.5)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 13.00
Speed rpm : 1265...1285

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ 1000 s: 140.0...180.0
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 6.00...6.20
Del.quantity cm³/ 1000 s: (11.5...20.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

: IHC #1815225C91#

Only perform pump setting with original
overflow valve without IH hose and
restrictor 1.2 mm diameter.
Before checking sleeve position,
first adjust latching.

In unlatched condition, do not
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before
shutoff.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC 7,6 X
 Edition : 28.09.90
 Replaces : 16.08.90
 Test oil : ISO-4113

Combination no. : 0 403 446 239

Injection pump
 Pump designation : PES6MW100/320RS1189
 EP type number : 0 413 406 177
 Governor
 Governor design. : RQV350...1200MW46-21
 Governor no. : 0 420 083 201

Customer-spec. information

Customer : NAVISTAR

Engine : DTA-466

1st version kW : 186.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder assembly : 1 688 901 101

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35
 : (3.20...3.40)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 14.00...14.10

Del.quantity cm³/ : 15.2...15.4

100 s: (15.0...15.6)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0
 Rack travel in mm : 5.3...5.5
 Del.quantity cm³/ : 1.6...2.0
 100 s: (1.3...2.2)
 Spread cm³ : 0.3
 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed	rpm	: 1450
	travel mm	: 9.80...10.20
2nd speed	rpm	: 1250
	travel mm	: 7.90...8.10
3rd speed	rpm	: 550
	travel mm	: 3.10...3.70
4th speed	rpm	: 350
	travel mm	: 1.30...1.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version	Speed	rpm	: 800
	Aneroid pressure h:	900	
	Del.quantity	:	152.0...154.0
	1000	:	(150.0...156.0)
Spread	cm ³	:	3.50
	1000	:	(6.00)

RATED SPEED

1st version

Control lever
position degrees: 104...112

Testing:

1st rack travel in: 13.00
Speed rpm : 1280...1300
2nd rack travel in: 4.00
Speed rpm : 1435...1445
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 68...76
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.4

Testing:

Speed rpm : 100
Minimum rack trave: 9.00
Speed rpm : 350
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION

Speed rpm : 300...450

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.40...9.50

Measurement

Speed 1/min : 500

1st pressure hPa : 250
Rack travel in m: 10.20...10.30
2nd pressure hPa : 550
Rack travel in m: 12.50...12.90
3rd pressure hPa : 900
Rack travel in m: 14.00...14.10

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 1200
Del.quantity cm3/ : 140.0...144.0
1000 s: (138.0...146.0)

Spread cm3 : 6.50
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 62.0...64.0
1000 s: (60.0...66.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 13.00
Speed rpm : 1280...1300

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 140.0...180.0
1000 s: (137.0...183.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.30...5.50
Del.quantity cm3/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

: IHC #1815503C91#
In unlatched condition, do not
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before
shutoff.

Only perform pump setting with original
overflow valve without IH hose and
restrictor 1.2 mm diameter.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC 7,6 W 6
 Edition : 19.10.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 403 446 240
 Injection pump
 Pump designation : PES6MW100/320RS1198
 EP type number : 0 413 406 188
 Governor
 Governor design. : RQV350...1200MW46-22
 Governor no. : 0 420 083 202
 Customer-spec. information
 Customer : NAVISTAR
 Engine : DTA-466
 1st version kW : 164.0
 Rated speed : 2400
TEST BENCH REQUIREMENTS
 Test oil
 inlet temp. °C : 38...42
 Overflow valve : 2 417 413 038
 Inlet press., bar : 2.80
 Test nozzle holder assembly : 1 688 901 101
 Opening pressure, bar : 207...210
 Orifice plate diameter mm : 0,6
 Test lines : 1 680 750 008
 Outside diameter x Wall thickness x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35
 : (3.20...3.40)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 12.00...12.10

Del.quantity cm³/ 100 s: 12.9...13.1

100 s: (12.7...13.3)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.2...5.4

Del.quantity cm³/ 100 s: 1.3...2.2

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed	rpm	: 1450
	travel mm	: 9.80...10.20
2nd speed	rpm	: 1250
	travel mm	: 7.90...8.10
3rd speed	rpm	: 550
	travel mm	: 3.10...3.70
4th speed	rpm	: 350
	travel mm	: 1.30...1.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed	rpm	: 800
Aneroid pressure h:		900
Del.quantity		: 129.0...131.0
	1000	: (127.0...133.0)
Spread	cm ³	: 3.50
	1000	: (6.00)

RATED SPEED

1st version		
Control lever		
position	degrees:	104...112

Testing:

1st rack travel in: 11.00
Speed rpm : 1285...1305
2nd rack travel in: 4.00
Speed rpm : 1405...1415
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 70...78
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.3

Testing:

Speed rpm : 100
Minimum rack trave: 9.00
Speed rpm : 350
Rack travel in mm : 5.20...5.40

CONSTANT REGULATION

Speed rpm : 300...450

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.20...9.30

Measurement

Speed 1/min : 500

1st pressure hPa : 275
Rack travel in m: 9.90...10.00
2nd pressure hPa : 550
Rack travel in m: 11.40...11.80
3rd pressure hPa : 900
Rack travel in m: 12.00...12.10

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900
Speed rpm : 1200
Del.quantity cm3/ : 126.5...130.5
1000 s: (124.5...132.5)
Spread cm3 : 6.50
1000 s: (7.0)
Aneroid pressure h: -

Speed rpm : 500
Del.quantity cm3/ : 74.0...76.0
1000 s: (72.0...78.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.00
Speed rpm : 1285...1305

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 140.0...180.0
1000 s: (137.0...183.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.20...5.40
Del.quantity cm3/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

: IGC #1815521C91#

Only perform pump setting with original
overflow valve without IH hose and
restrictor 1.2 mm diameter.
In unlatched condition, do not
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before
shutoff.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC 7,6 W 1
 Edition : 28.09.90
 Replaces : 10.08.90
 Test oil : ISO-4113

Combination no. : 0 403 446 241

Injection pump
 Pump designation : PES6MW100/320RS1198
 EP type number : 0 413 406 188
 Governor
 Governor design. : RQV350...1200MW46-23
 Governor no. : 0 420 083 203

Customer-spec. information
 Customer : NAVISTAR

Engine : DT -466

1st version kW : 157.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35
 : (3.20...3.40)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 12.10...12.20

Del.quantity cm³/ : 13.3...13.5

100 s: (13.1...13.7)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.3...5.5

Del.quantity cm³/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1450
 travel mm : 9.80...10.20

2nd speed rpm : 1250

travel mm : 7.90...8.10

3rd speed rpm : 550

travel mm : 3.10...3.70

4th speed rpm : 350

travel mm : 1.30...1.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800

Aneroid pressure h: 900

Del.quantity 1000 : 133.0...135.0

1000 : (131.0...137.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever
position degrees: 102...110

Testing:

1st rack travel in: 11.10
Speed rpm : 1270...1290
2nd rack travel in: 4.00
Speed rpm : 1405...1415
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 70...78
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.4

Testing:

Speed rpm : 100
Minimum rack trave: 9.00
Speed rpm : 350
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION

Speed rpm : 300...450

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.00...9.10

Measurement

Speed 1/min : 500

1st pressure hPa : 220
Rack travel in m: 9.70...9.80
2nd pressure hPa : 500
Rack travel in m: 11.30...11.70
3rd pressure hPa : 900
Rack travel in m: 12.10...12.20

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900
Speed rpm : 1200
Del.quantity cm3/ : 128.0...132.0
1000 s: (126.0...134.0)

Spread cm3 : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 74.0...76.0
1000 s: (72.0...78.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.10
Speed rpm : 1270...1290

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 130.0...170.0
1000 s: (125.0...175.0)
Rack travel in mm : 12.50...13.50

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.30...5.50
Del.quantity cm3/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

: IHC #1815518C91#
Only perform pump setting with original
overflow valve without IH hose and
restrictor 1.2 mm diameter.
In unlatched condition, do not
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before
shutoff.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC 7,6 W 4
 Edition : 28.09.90
 Replaces : 31.08.90
 Test oil : ISO-4113

 Combination no. : 0 403 446 242

 Injection pump
 Pump designation : PES6MW100/320RS1198
 EP type number : 0 413 406 188
 Governor
 Governor design. : RQV350...1200MW46-24
 Governer no. : 0 420 083 204

 Customer-spec. information
 Customer : NAVISTAR

 Engine : DT -466

 1st version kW : 157.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

 Test oil
 inlet temp. °C : 38...42

 Overflow valve : 2 417 413 038

 Inlet press., bar : 2.80

 Test nozzle holder assembly : 1 688 901 101

 Opening pressure, bar : 207...210

 Orifice plate diameter mm : 0,6

 Test Lines : 1 680 750 008

 Outside diameter x Wall thickness x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm	: 3.25...3.35
	: (3.20...3.40)
Rack travel in mm	: 9.00...12.00
Firing order	: 1- 5- 3- 6- 2- 4
Phasing	: 0-60-120-180-240-300
Tolerance + - °	: 0.50 (0.75)
Time to cyl. no.	: 1
BASIC SETTING	
1st speed rpm	: 800
Rack travel in mm	: 12.10...12.20
Del.quantity cm ³ /	: 13.3...13.5
100 s:	(13.1...13.7)
Spread cm ³	: 0.3
100 s:	(0.6)
2nd speed rpm	: 350.0
Rack travel in mm	: 5.3...5.5
Del.quantity cm ³ /	: 1.6...2.0
100 s:	(1.3...2.2)
Spread cm ³	: 0.3
100 s:	(0.5)
(B) Setting of injection pump with governor	
GUIDE SLEEVE TRAVEL	
1st speed rpm	: 1450
travel mm	: 9.80...10.20
2nd speed rpm	: 1250
travel mm	: 7.90...8.10
3rd speed rpm	: 550
travel mm	: 3.10...3.70
4th speed rpm	: 350
travel mm	: 1.30...1.70
FULL LOAD DELIV. AT FULL LOAD STOP	
1st version	
Speed rpm	: 800
Aneroid pressure h:	900
Del.quantity	: 133.0...135.0
1000	: (131.0...137.0)
Spread cm ³	: 3.50
1000	: (6.00)
RATED SPEED	
1st version	

Control lever
position degrees: 102...110

Testing:

1st rack travel in: 11.10
Speed rpm : 1270...1290
2nd rack travel in: 4.00
Speed rpm : 1405...1415
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 70...78
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.4

Testing:

Speed rpm : 100
Minimum rack trave: 9.00
Speed rpm : 350
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION

Speed rpm : 300...450

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.80...9.90

Measurement

Speed 1/min : 500

1st pressure hPa : 215
Rack travel in m: 10.30...10.40
2nd pressure hPa : 425
Rack travel in m: 11.40...11.80
3rd pressure hPa : 900
Rack travel in m: 12.10...12.20

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 1200
Del.quantity cm3/ : 128.0...132.0
1000 s: (126.0...134.0)

Spread cm3 : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 88.0...90.0
1000 s: (86.0...92.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.10
Speed rpm : 1270...1290

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 130.0...170.0
1000 s: (125.0...175.0)
Rack travel in mm : 12.50...13.50

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.30...5.50
Del.quantity cm3/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

: IHC #1815515C91#
Only perform pump setting with original
overflow valve without IH hose and
restrictor 1.2 mm diameter.
In unlatched condition, do not
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before
shutoff.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC 7,6 X 2
 Edition : 28.09.90
 Replaces : 31.08.90
 Test oil : ISO-4113
 Combination no. : 0 403 446 244
 Injection pump
 Pump designation : PES6MW100/320RS1189
 EP type number : 0 413 406 177
 Governor
 Governor design. : RQV350...1200MW46-26
 Governer no. : 0 420 083 206

Customer-spec. information

Customer : NAVISTAR

Engine : DTA-466

1st version kW : 201.0
Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY
Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35
: (3.20...3.40)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 14.50...14.60

Del.quantity cm³/

100 s: (15.9...16.5)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.2...5.4

Del.quantity cm³/

100 s: (1.3...2.2)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed	rpm	: 1450
travel mm		: 9.80...10.20
2nd speed	rpm	: 1250
travel mm		: 7.90...8.10
3rd speed	rpm	: 550
travel mm		: 3.10...3.70
4th speed	rpm	: 350
travel mm		: 1.30...1.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800

Aneroid pressure h: 1200

Del.quantity : 161.0...163.0

1000 : (159.0...165.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever
position degrees: 102...110

Testing:

1st rack travel in: 13.10
Speed rpm : 1270...1290
2nd rack travel in: 4.00
Speed rpm : 1430...1440
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 66...74
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.3

Testing:

Speed rpm : 100
Minimum rack trave: 9.00
Speed rpm : 350
Rack travel in mm : 5.20...5.40

CONSTANT REGULATION

Speed rpm : 300...450

TORQUE CONTROL

Dimension a mm : 0.40
Torque control curve - 1st version
1st speed rpm : 800
Rack travel in m: 14.50...14.60
2nd speed rpm : 1200
Rack travel in m: 14.10...14.20
3rd speed rpm : 1050
Rack travel in m: 14.30...14.50

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 8.90...9.00

Measurement

Speed 1/min : 500

1st pressure hPa : 275
Rack travel in m: 10.40...10.50
2nd pressure hPa : 585
Rack travel in m: 12.90...13.20
3rd pressure hPa : 1200
Rack travel in m: 14.50...14.60

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 1200
Del.quantity cm3/ : 146.0...150.0
1000 s: (144.0...152.0)
Spread cm3 : 6.50
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 61.5...63.5
1000 s: (59.5...65.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 13.10
Speed rpm : 1270...1290

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 150.0...190.0
1000 s: (147.0...193.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.20...5.40
Del.quantity cm3/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

: IHC #1815520C91#

In unlatched condition, do not
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before
shutoff.

Only perform pump setting with original
overflow valve without IH hose and
restrictor 1.2 mm diameter.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC 7,7 A
 Edition : 17.10.90
 Replaces : 10.08.90
 Test oil : ISO-4113

Combination no. : 0 403 446 245

Injection pump
 Pump designation : PES6MW100/320RS1204
 EP type number : 0 413 406 192
 Governor
 Governor design. : RQV350...1350MW45-27
 Governer no. : 0 420 083 207

Customer-spec. information
 Customer : NAVISTAR

Engine : DTA-360

1st version kW : 138.0
 Rated speed : 2700

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35
 : (3.20...3.40)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 10.80...10.90

Del.quantity cm³/

100 s: (11.0...11.6)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.2...5.4

Del.quantity cm³/

100 s: (1.3...2.2)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 8.20...8.60

2nd speed rpm : 1350

travel mm : 7.40...7.60

3rd speed rpm : 500

travel mm : 2.50...3.10

4th speed rpm : 350

travel mm : 1.30...1.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 900

Del.quantity : 112.0...114.0

1000 : (110.0...116.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever
position degrees: 104...112

Testing:

1st rack travel in: 9.80
Speed rpm : 1415...1435
2nd rack travel in: 4.00
Speed rpm : 1510...1520
4th rack travel in: 1600
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 72...80
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.3

Testing:

Speed rpm : 100
Minimum rack trave: 9.00
Speed rpm : 350
Rack travel in mm : 5.20...5.40

CONSTANT REGULATION

Speed rpm : 300...450

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 8.70...8.80

Measurement

Speed 1/min : 500

1st pressure hPa : 210
Rack travel in m: 9.20...9.30
2nd pressure hPa : 410
Rack travel in m: 10.10...10.50
3rd pressure hPa : 900
Rack travel in m: 10.80...10.90

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900
Speed rpm : 1350
Del.quantity cm3/ : 107.5...111.5
1000 s: (105.5...113.5)

Spread cm3 : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 68.0...70.0
1000 s: (66.0...72.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 9.80
Speed rpm : 1415...1435

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 130.0...170.0
1000 s: (127.0...173.0)
Rack travel in mm : 13.00...14.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.20...5.40
Del.quantity cm3/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

: IHC #1815516C91#
Only perform pump setting with original
overflow valve without IH hose and
restrictor 1.2 mm diameter.
In unlatched condition, do not
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before
shutoff.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 6,1 V
 Edition : 14.09.90
 Replaces : 02.05.90
 Test oil : ISO-4113

Combination no. : 0 403 446 247

Injection pump
 Pump designation : PES6MW100/720RS1195
 EP type number : 0 413 406 183
 Governor
 Governor design. : RQV300...1150MW107
 Governor no. : 0 420 083 208

Customer-spec. information
 Customer : KHD

Engine : BF 6L 913 C

1st version kW : 101.0
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 740 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 4.00...4.10
 : (3.95...4.15)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 9.70...9.80

Del.quantity cm³/

100 s: (8.2...8.8)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 315.0

Rack travel in mm : 7.5...7.7

Del.quantity cm³/

100 s: (1.0...1.9)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1200

travel mm : 9.80...10.20

2nd speed rpm : 800

travel mm : 5.90...6.10

3rd speed rpm : 450

travel mm : 3.00...3.60

4th speed rpm : 300

travel mm : 1.60...2.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1050

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 1000

Del.quantity : 84.0...86.0

1000 : (82.0...88.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 40...48

Testing:

1st rack travel in: 8.70
Speed rpm : 1180...1190
2nd rack travel in: 4.00
Speed rpm : 1230...1260
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 13...21

Setting point w/out bumper spring
Speed rpm : 315
Rack travel in mm : 7.6

Testing:

Speed rpm : 100
Minimum rack trave: 9.00
Speed rpm : 315
Rack travel in mm : 7.50...7.70
Rack travel in mm : 2.00
Speed rpm : 420...480

TORQUE CONTROL

Dimension a mm : 0.75
Torque control curve - 1st version
1st speed rpm : 1150
Rack travel in m: 9.70...9.80
2nd speed rpm : 800
Rack travel in m: 10.30...10.50
3rd speed rpm : 1030
Rack travel in m: 10.00...10.20

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.00...10.20

Measurement

Speed 1/min : 500
2nd pressure hPa : 450
Rack travel in m: 10.20...10.30
3rd pressure hPa : 1000
Rack travel in m: 10.30...10.50

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000
Speed rpm : 800
Del.quantity cm³/ : 86.0...89.0
1000 s: (83.5...91.5)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 69.0...71.0
1000 s: (67.0...73.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 8.70
Speed rpm : 1180...1190

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 110.0...130.0
1000 s: (107.0...133.0)

LOW IDLE

Speed rpm : 315
Rack travel in mm : 7.50...7.70
Del.quantity cm³/ : 13.0...17.0
1000 s: (10.5...19.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

Test electrically-released starting quantity (EES) with 12 volts

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI 6,2 F
 Edition : 17.09.90
 Replaces : 29.06.90
 Test oil : ISO-4113

Combination no. : 0 403 446 251

Injection pump
 Pump designation : PES6MW100/320RS1202
 EP type number : 0 413 406 187
 Governor
 Governor design. : RQ750MW112
 Governor no. : 0 420 082 042

Customer-spec. information
 Customer : RVI

Engine : LDR 10

1st version kW : 100.0
 Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 033

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10
 : (2.95...3.15)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 14.50...14.60

Del.quantity cm³/ : 13.3...13.5

100 s: (13.1...13.7)

Spread cm³ : 0.3

100 s: (0.6)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700
 Del.quantity : 133.5...135.5
 1000 : (131.5...137.5)
 Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version

Control lever
 position degrees: 29...35

Testing:

1st rack travel in: 13.50
 Speed rpm : 750...755
 2nd rack travel in: 4.00
 Speed rpm : 795...805
 4th rack travel in: 825
 Speed rpm : 0.00...1.00

BREAKAWAY

1st version

1mm rack travel less than
 full load rack tr: 13.50
 Speed rpm : 750...755

STARTING FUEL DELIVERY

Speed rpm : 100
 Del.quantity cm³/ : 70.0...80.0
 1000 s: (67.0...83.0)

Rack travel in mm : 19.00...21.00

Remarks:

:

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC 7,7 A 2
 Edition : 17.10.90
 Replaces : -
 Test oil : ISO-4113

 Combination no. : 0 403 446 252

 Injection pump
 Pump designation : PES6MW100/320RS1204
 EP type number : 0 413 406 192
 Governor
 Governor design. : RQV350...1350MW46-28
 Governor no. : 0 420 083 214

 Customer-spec. information
 Customer : NAVISTAR

 Engine : DTA-366

 1st version kW : 127.0
 Rated speed : 2700

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

 Overflow valve : 2 417 413 038

 Inlet press., bar : 2.80

 Test nozzle holder assembly : 1 688 901 101

 Opening pressure, bar : 207...210

 Orifice plate diameter mm : 0,6

 Test Lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35
 : (3.20...3.40)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 10.80...10.90

Del.quantity cm³/ : 11.2...11.4

100 s: (11.0...11.6)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.2...5.4

Del.quantity cm³/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed	rpm	: 1450
	travel mm	: 8.20...8.60
2nd speed	rpm	: 1350
	travel mm	: 7.40...7.60
3rd speed	rpm	: 500
	travel mm	: 2.50...3.10
4th speed	rpm	: 350
	travel mm	: 1.30...1.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed	rpm	: 850
Aneroid pressure h:	900	
Del.quantity		: 112.5...114.5
	1000	: (110.5...116.5)
Spread	cm ³	: 3.50
	1000	: (6.00)

RATED SPEED

1st version

Control lever
position degrees: 102...110

Testing:

1st rack travel in: 9.80
Speed rpm : 1420...1440
2nd rack travel in: 4.00
Speed rpm : 1520...1530
4th rack travel in: 1650
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 70...78
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.3

Testing:

Speed rpm : 100
Minimum rack trave: 9.00
Speed rpm : 350
Rack travel in mm : 5.20...5.40

CONSTANT REGULATION

Speed rpm : 300...450

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 8.00...8.10

Measurement

Speed 1/min : 500

1st pressure hPa : 205
Rack travel in m: 8.70...8.80
2nd pressure hPa : 395
Rack travel in m: 9.90...10.30
3rd pressure hPa : 900
Rack travel in m: 10.80...10.90

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900
Speed rpm : 1350
Del.quantity cm3/ : 108.0...111.0
1000 s: (105.5...113.5)

Spread cm3 : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 57.5...59.5
1000 s: (55.5...61.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 9.80
Speed rpm : 1420...1440

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 140.0...180.0
1000 s: (137.0...183.0)
Rack travel in mm : 13.00...14.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.20...5.40
Del.quantity cm3/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

: IHC #1816727C91#
Only perform pump setting with original
overflow valve without IH hose and
restrictor 1.2 mm diameter.
In unlatched condition, do not
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before
shutoff.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC 7,6 X 1
 Edition : 28.09.90
 Replaces : 16.08.90
 Test oil : ISO-4113

Combination no. : 0 403 446 255

Injection pump
 Pump designation : PES6MW100/320RS1189
 EP type number : 0 413 406 177
 Governor
 Governor design. : RQV350...1200MW46-30
 Governer no. : 0 420 083 218

Customer-spec. information

Customer : NAVISTAR

Engine : DTA-466

1st version kW : 201.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder assembly : 1 688 901 101

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35
 : (3.20...3.40)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 14.50...14.60

Del.quantity cm³/ : 16.1...16.3

100 s: (15.9...16.5)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0
 Rack travel in mm : 5.2...5.4
 Del.quantity cm³/ : 1.6...2.0
 100 s: (1.3...2.2)
 Spread cm³ : 0.3
 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed	rpm	: 1450
	travel mm	: 9.80...10.20
2nd speed	rpm	: 1250
	travel mm	: 7.90...8.10
3rd speed	rpm	: 550
	travel mm	: 3.10...3.70
4th speed	rpm	: 350
	travel mm	: 1.30...1.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed	rpm	: 800
Aneroid pressure h:	1200	
Del.quantity		: 161.0...163.0
	1000	: (159.0...165.0)
Spread	cm ³	: 3.50
	1000	: (6.00)

RATED SPEED

1st version

Control lever
position degrees: 102...110

Testing:

1st rack travel in: 13.10
Speed rpm : 1270...1290
2nd rack travel in: 4.00
Speed rpm : 1430...1440
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 66...74
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.3

Testing:

Speed rpm : 100
Minimum rack trave: 9.00
Speed rpm : 350
Rack travel in mm : 5.20...5.40

CONSTANT REGULATION

Speed rpm : 300...450

TORQUE CONTROL

Dimension a mm : 0.40
Torque control curve - 1st version
1st speed rpm : 800
Rack travel in m: 14.50...14.60
2nd speed rpm : 1200
Rack travel in m: 14.10...14.20
3rd speed rpm : 1050
Rack travel in m: 14.30...14.50

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.30...10.40

Measurement

Speed 1/min : 500

1st pressure hPa : 260
Rack travel in m: 11.00...11.10
2nd pressure hPa : 650
Rack travel in m: 13.20...13.50
3rd pressure hPa : 1200
Rack travel in m: 14.50...14.60

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 1200
Del.quantity cm³/ : 146.0...150.0
1000 s: (144.0...152.0)
Spread cm³ : 6.50
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 83.5...85.5
1000 s: (81.5...87.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 13.10
Speed rpm : 1270...1290

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 150.0...190.0
1000 s: (147.0...193.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.20...5.40
Del.quantity cm³/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

: IHC #1816731C91#

Only perform pump setting with original
overflow valve without IH hose and
restrictor 1.2 mm diameter.
In unlatched condition, do not
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before
shutoff.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC 7,6 W 5
 Edition : 19.10.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 403 446 256
 Injection pump
 Pump designation : PES6MW100/320RS1198
 EP type number : 0 413 406 188
 Governor
 Governor design. : RQV350...1200MW46-38
 Governer no. : 0 420 083 219

Customer-spec. information

Customer : NAVISTAR

Engine : DTA-466

1st version kW : 164.0
Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY
Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35
: (3.20...3.40)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 12.00...12.10

Del.quantity cm³/

100 s: (12.7...13.3)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0
Rack travel in mm : 5.2...5.4
Del.quantity cm³/ : 1.6...2.0
100 s: (1.3...2.2)

Spread cm³ : 0.3
100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed	rpm	: 1450
	travel mm	: 9.80...10.20
2nd speed	rpm	: 1250
	travel mm	: 7.90...8.10
3rd speed	rpm	: 550
	travel mm	: 3.10...3.70
4th speed	rpm	: 350
	travel mm	: 1.30...1.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed	rpm	: 800
Aneroid pressure h:	900	
Del.quantity		: 129.0...131.0
1000		: (127.0...133.0)
Spread	cm ³	: 3.50
	1000	: (6.00)

RATED SPEED

1st version

Control lever	
position	degrees: 104...112

Testing:
1st rack travel in: 11.00
Speed rpm : 1285...1305
2nd rack travel in: 4.00
Speed rpm : 1405...1415
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 70...78
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.3

Testing:
Speed rpm : 100
Minimum rack trave: 9.00
Speed rpm : 350
Rack travel in mm : 5.20...5.40

CONSTANT REGULATION

Speed rpm : 300...450

Aneroid/Altitude Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.60...9.70

Measurement
Speed 1/min : 500

1st pressure hPa : 235
Rack travel in m: 10.10...10.20
2nd pressure hPa : 485
Rack travel in m: 11.10...11.50
3rd pressure hPa : 900
Rack travel in m: 12.00...12.10

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 1200
Del.quantity cm3/ : 126.5...130.5
1000 s: (124.5...132.5)
Spread cm3 : 6.50
1000 s: (7.0)
Aneroid pressure h: -

Speed rpm : 500
Del.quantity cm3/ : 81.5...83.5
1000 s: (79.5...83.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.00
Speed rpm : 1285...1305

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 140.0...180.0
1000 s: (137.0...183.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.20...5.40
Del.quantity cm3/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

: IMC #1816726C91#
Only perform pump setting with original
overflow valve without IH hose and
restrictor 1.2 mm diameter.
In unlatched condition, do not
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before
shutoff.

1st version
Control lever
position degrees: 116...124

Testing:

1st rack travel in: 10.50
Speed rpm : 1340...1350
2nd rack travel in: 4.00
Speed rpm : 1440...1470
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1

Control Lever
position degrees: 82...90
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.5

Testing:

Speed rpm : 100
Minimum rack trave: 7.00
Speed rpm : 300
Rack travel in mm : 5.50...5.60

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

CONSTANT REGULATION

Speed rpm : 320...530

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 300
Rack travel mm : 8.30...8.50

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 7.40...7.50
2nd pressure hPa : 450
Rack travel in m: 10.00...10.20
3rd pressure hPa : 1000
Rack travel in m: 11.50...11.60

START CUT-OUT

Speed 1/min : 220 (230)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1000

Speed rpm : 600
Del.quantity cm³/ 1000 s: 85.5...88.5
cm³ : (83.0...91.0)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ 1000 s: 27.0...29.0
cm³ : (25.0...31.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.50
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ 1000 s: 88.0...98.0
cm³ : (85.0...101.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 5.50...5.60
Del.quantity cm³/ 1000 s: 9.0...11.0
cm³ : (6.0...14.0)
Spread cm³ : 3.50
1000 s: (5.00)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC 7,7 A 3
 Edition : 17.10.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 403 446 261
 Injection pump
 Pump designation : PES6MW100/320RS1204
 EP type number : 0 413 406 192
 Governor
 Governor design. : RQV350...1350MW46-32
 Governor no. : 0 420 083 225

Customer-spec. information
 Customer : NAVISTAR

Engine : DTA-360CHT
 1st version kW : 138.0
 Rated speed : 2700

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35
 : (3.20...3.40)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 11.50...11.60

Del.quantity cm³/ : 12.0...12.2

100 s: (11.8...12.4)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0
 Rack travel in mm : 5.2...5.4
 Del.quantity cm³/ : 1.6...2.0
 100 s: (1.3...2.2)
 Spread cm³ : 0.3
 100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1450
 travel mm : 8.20...8.60
 2nd speed rpm : 1350
 travel mm : 7.40...7.60
 3rd speed rpm : 500
 travel mm : 2.50...3.10
 4th speed rpm : 350
 travel mm : 1.30...1.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850
 Aneroid pressure h: 900
 Del.quantity 1000 : 120.0...122.0
 : (118.0...124.0)
 Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version

Control lever
position degrees: 104...112

Testing:

1st rack travel in: 9.80
Speed rpm : 1415...1435
2nd rack travel in: 4.00
Speed rpm : 1510...1520
4th rack travel in: 1600
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 72...80
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.3

Testing:

Speed rpm : 100
Minimum rack trave: 9.00
Speed rpm : 350
Rack travel in mm : 5.20...5.40

CONSTANT REGULATION

Speed rpm : 300...450

TORQUE CONTROL

Dimension a mm : 0.70
Torque control curve - 1st version
1st speed rpm : 1350
Rack travel in m: 10.80...10.90
2nd speed rpm : 850
Rack travel in m: 11.50...11.60
3rd speed rpm : 1050
Rack travel in m: 11.10...11.30

**Aneroid/Altitude
Compensator Test**

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 7.90...8.00

Measurement

Speed 1/min : 500
1st pressure hPa : 300
Rack travel in m: 8.80...8.90
2nd pressure hPa : 580
Rack travel in m: 10.40...10.80
3rd pressure hPa : 900
Rack travel in m: 11.50...11.60

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 1350
Del.quantity cm³/ 1000 s: 107.5...111.5
1000 s: (105.5...113.5)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ 1000 s: 54.0...56.0
1000 s: (52.0...58.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 9.80
Speed rpm : 1415...1435

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ 1000 s: 140.0...180.0
1000 s: (137.0...183.0)
Rack travel in mm : 13.00...14.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.20...5.40
Del.quantity cm³/ 1000 s: 16.0...20.0
1000 s: (13.5...22.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks: : IHC #1817192C91#

Only perform pump setting with original
overflow valve without IH hose and
restrictor 1.2 mm diameter.
In unlatched condition, do not
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before
shutoff.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC 7,6 W 2
 Edition : 17.09.90
 Replaces : 16.08.90
 Test oil : ISO-4113

Combination no. : 0 403 446 262

Injection pump
 Pump designation : PES6MW100/320RS1198
 EP type number : 0 413 406 188
 Governor
 Governor design. : RQV350...1200MW46-33
 Governor no. : 0 420 083 226

Customer-spec. information

Customer : NAVISTAR

Engine : DTA-466

1st version kW : 172.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35
 : (3.20...3.40)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 12.10...12.20

Del.quantity cm³/ : 13.1...13.3

100 s: (12.9...13.5)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.2...5.4

Del.quantity cm³/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 9.80...10.20

2nd speed rpm : 1250

travel mm : 7.80...8.10

3rd speed rpm : 550

travel mm : 3.10...3.70

4th speed rpm : 350

travel mm : 1.30...1.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800

Aneroid pressure h: 900

Del.quantity : 131.0...133.0

1000 : (129.0...135.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 98...106

Testing:
1st rack travel in: 11.10
Speed rpm : 1270...1290
2nd rack travel in: 4.00
Speed rpm : 1405...1415
4th rack travel in: 1500
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 66...74
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.3

Testing:
Speed rpm : 100
Minimum rack trave: 9.00
Speed rpm : 350
Rack travel in mm : 5.20...5.40

CONSTANT REGULATION
Speed rpm : 300...450

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.10...9.20

Measurement
Speed 1/min : 500

1st pressure hPa : 200
Rack travel in m: 9.60...9.70
2nd pressure hPa : 575
Rack travel in m: 11.30...11.70
3rd pressure hPa : 900
Rack travel in m: 12.10...12.20

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 1200
Del.quantity cm3/ : 128.5...132.5
1000 s: (126.5...134.5)
Spread cm3 : 6.50
1000 s: (7.0)
Aneroid pressure h: -

Speed rpm : 500
Del.quantity cm3/ : 72.0...74.0
1000 s: (70.0...76.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.10
Speed rpm : 1270...1290

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 130.0...170.0
1000 s: (127.0...173.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.20...5.40
Del.quantity cm3/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks: : IHC #1817194C91#

Only perform pump setting with original
overflow valve without IH hose and
restrictor 1.2 mm diameter.
In unlatched condition, do not
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before
shutoff.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC 7,6 W 3
 Edition : 17.09.90
 Replaces : 16.08.90
 Test oil : ISO-4113

Combination no. : 0 403 446 263

Injection pump
 Pump designation : PES6MW100/320RS1198
 EP type number : 0 413 406 188
 Governor
 Governor design. : RQV350...1200MW46-34
 Governor no. : 0 420 083 227

Customer-spec. information

Customer : NAVISTAR

Engine : DTA-466

1st version kW : 172.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35
 : (3.20...3.40)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 12.10...12.20

Del.quantity cm³/ : 13.1...13.3

100 s: (12.9...13.5)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.2...5.4

Del.quantity cm³/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 9.80...10.20

2nd speed rpm : 1250

travel mm : 7.90...8.10

3rd speed rpm : 550

travel mm : 3.10...3.70

4th speed rpm : 350

travel mm : 1.30...1.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800

Aneroid pressure h: 900

Del.quantity : 131.0...133.0

1000 : (129.0...135.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 98...106

Testing:
1st rack travel in: 11.10
Speed rpm : 1270...1290
2nd rack travel in: 4.00
Speed rpm : 1405...1415
4th rack travel in: 1500
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 66...74
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.3

Testing:
Speed rpm : 100
Minimum rack trave: 9.00
Speed rpm : 350
Rack travel in mm : 5.20...5.40

CONSTANT REGULATION
Speed rpm : 300...450

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.20...9.30

Measurement
Speed 1/min : 500
1st pressure hPa : 250
Rack travel in m: 10.00...10.10
2nd pressure hPa : 575
Rack travel in m: 11.20...11.60
3rd pressure hPa : 900
Rack travel in m: 12.10...12.20

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 1200
Del.quantity cm³/ : 128.5...132.5
1000 s: (126.5...134.5)
Spread cm³ : 6.50
1000 s: (7.0)
Aneroid pressure h: -

Speed rpm : 500
Del.quantity cm³/ : 76.0...78.0
1000 s: (74.0...80.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.10
Speed rpm : 1270...1290

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 130.0...170.0
1000 s: (127.0...173.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.20...5.40
Del.quantity cm³/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:
: IHC #1817193C91#

Only perform pump setting with original
overflow valve without IH hose and
restrictor 1.2 mm diameter.
In unlatched condition, do not
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before
shutoff.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 81
 Edition : 17.10.90
 Replaces : 05.03.90
 Test oil : ISO-4113
 Combination no. : 0 403 446 264
 Injection pump
 Pump designation : PES6MW100/720RS1144
 EP type number : 0 413 406 138
 Governor
 Governor design. : RQ300/1200MW96-1
 Governor no. : 0 420 082 045
 Customer-spec. information
 Customer : MB-NFZ
 Engine : OM366A
 1st version kW : 116.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 047
 Inlet press., bar : 1.50
 Test nozzle holder assembly : 0 681 343 009
 Opening pressure, bar : 172...175
 Test Lines : 1 680 750 015
 Outside diameter x Wall thickness x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32
 Prestroke mm : 3.70...3.80
 : (3.65...3.85)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1200
 Rack travel in mm : 11.00...11.10
 Del.quantity cm³/ : 7.7...7.9
 100 s: (7.5...8.1)

Spread cm³ : 0.3
 100 s: (0.6)

2nd speed rpm : 300.0
 Rack travel in mm : 7.9...8.1
 Del.quantity cm³/ : 1.0...1.4
 100 s: (0.8...1.5)

Spread cm³ : 0.3
 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1300
 travel mm : 8.10...8.50
 2nd speed rpm : 1200
 travel mm : 6.90...7.10
 3rd speed rpm : 550
 travel mm : 5.40...6.00
 4th speed rpm : 300
 travel mm : 2.40...2.80

GUIDE SLEEVE POSITION

Control-lever position
 Degree: 108
 Speed rpm : 900
 Rack travel in mm : 14.70...16.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1200
 Del.quantity : 77.0...79.0
 1000 : (75.0...81.0)
 Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version

Control lever
position degrees: 96...104

Setting point:

Speed rpm : 900
Rack travel in mm : 15.5

Testing:

1st rack travel in: 10.00
Speed rpm : 1240...1255
2nd rack travel in: 4.00
Speed rpm : 1320...1350
4th rack travel in: 1500
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 76...84

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 8.0

Testing:

Speed rpm : 200
Minimum rack trave: 9.50
Speed rpm : 300
Rack travel in mm : 7.90...8.10

CONSTANT REGULATION

Speed rpm : 330...500

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700
Del.quantity cm³/ : 62.0...65.0
1000 s: (59.5...67.5)
Spread cm³ : 5.00
1000 s: (7.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.00
Speed rpm : 1240...1255

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 80.0...90.0
1000 s: (77.0...93.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 7.90...8.10
Del.quantity cm³/ : 10.0...14.0
1000 s: (8.5...15.5)
Spread cm³ : 3.50
1000 s: (5.00)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 99
 Edition : 19.10.90
 Replaces : -
 Test oil : ISO-4113

 Combination no. : 0 403 446 270

 Injection pump
 Pump designation : PES6MW100/720RS1144
 EP type number : 0 413 406 138
 Governor
 Governor design. : RQV300...1300MW50-10
 Governor no. : 0 420 083 234

 Customer-spec. information
 Customer : MB-NFZ

 Engine : OM366A

 1st version kW : 125.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

 Test oil
 inlet temp. °C : 38...42

 Overflow valve : 1 417 413 047

 Inlet press., bar : 1.50

 Test nozzle holder assembly : 0 681 343 009

 Opening pressure, bar : 172...175

 Test lines : 1 680 750 015

 Outside diameter x Wall thickness x Length mm : 6.00X1.50X600

(A) **Injection pump setting values**
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

 Prestroke mm : 3.70...3.80
 : (3.65...3.85)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - * : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 10.90...11.00

Del.quantity cm³/

100 s: (7.0...7.6)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 7.8...8.0

Del.quantity cm³/

100 s: (0.6...1.5)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 8.50...8.70

2nd speed rpm : 1450

travel mm : 9.50...9.90

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.70

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1350

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 900

Del.quantity : 72.0...74.0

1000 : (70.0...76.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 110...118

Testing:

1st rack travel in: 9.90
Speed rpm : 1340...1350
2nd rack travel in: 4.00
Speed rpm : 1425...1455
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 80...88
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 7.9
Speed rpm : 300
Rack travel in mm : 7.80...8.00

CONSTANT REGULATION

Speed rpm : 330...500

TORQUE CONTROL

Dimension a mm : 1.30
Torque control curve - 1st version
1st speed rpm : 1300
Rack travel in m: 10.90...11.00
2nd speed rpm : 800
Rack travel in m: 11.70...11.90
3rd speed rpm : 585
Rack travel in m: 12.20...12.30

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.70...9.80

Measurement
Speed 1/min : 500

1st pressure hPa : 300
Rack travel in m: 10.00...10.10
2nd pressure hPa : 460
Rack travel in m: 11.20...11.50
3rd pressure hPa : 900
Rack travel in m: 12.20...12.30

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 800
Del.quantity cm³/ 1000 s: 71.0...74.0
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: 900
Speed rpm : 585
Del.quantity cm³/ 1000 s: 65.0...68.0
1000 s: (62.5...70.5)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ 1000 s: 27.0...29.0
1000 s: (25.0...31.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 9.90
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ 1000 s: 78.0...88.0
1000 s: (75.0...91.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 300
Rack travel in mm : 7.80...8.00
Del.quantity cm³/ 1000 s: 9.0...13.0
1000 s: (6.5...15.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6.1 A
 Edition : 05.11.90
 Replaces : -
 Test oil : ISO-4113

Combination no. : 0 403 446 271

Injection pump
 Pump designation : PES6MW100/720RS1144
 EP type number : 0 413 406 138
 Governor
 Governor design. : RGV300...1300MW50-11
 Governer no. : 0 420 083 235

Customer-spec. information
 Customer : MB-NFZ

Engine : OM366A

1st version kW : 129.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 11.40...11.50

Del.quantity cm³/ : 7.8...8.0

100 s: (7.6...8.2)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 8.9...9.1

Del.quantity cm³/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1350

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 900

Del.quantity : 78.0...80.0

1000 : (76.0...82.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 108...116

Testing:

1st rack travel in: 10.40

Speed rpm : 1340...1350

2nd rack travel in: 4.00

Speed rpm : 1425...1455

4th rack travel in: 1550

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 76...84
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 9.0
Speed rpm : 300
Rack travel in mm : 8.90...9.10

CONSTANT REGULATION
Speed rpm : 330...500

TORQUE CONTROL
Dimension a mm : 1.10
Torque control curve - 1st version
1st speed rpm : 1300
Rack travel in m: 11.40...11.50
2nd speed rpm : 600
Rack travel in m: 12.50...12.60
3rd speed rpm : 1000
Rack travel in m: 11.50...11.60

Aneroid/Altitude Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.80...10.90

Measurement
Speed 1/min : 500
1st pressure hPa : 225
Rack travel in m: 11.20...11.40
2nd pressure hPa : 325
Rack travel in m: 11.90...12.10
3rd pressure hPa : 900
Rack travel in m: 12.50...12.60

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 600
Del.quantity cm³/ : 67.0...70.0
1000 s: (64.5...72.5)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 37.0...39.0
1000 s: (35.0...41.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.40
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 78.0...88.0
1000 s: (75.0...91.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 8.90...9.10
Del.quantity cm³/ : 9.0...13.0
1000 s: (6.5...15.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 7/2 Q
 Edition : 17.09.90
 Replaces : 24.11.89
 Test oil : ISO-4113

Combination no. : 0 403 456 111

Injection pump
 Pump designation : PES6MW100/321RS1186
 EP type number : 0 413 406 168
 Governor
 Governor design. : RQ250/1200MW84-4
 Governor no. : 0 420 082 044

Customer-spec. information
 Customer : MAN

Engine : D 0826 LUH

1st version kW : 157.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.60...3.70
 : (3.55...3.75)

Rack travel in mm : 15.00...0.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 14.70...14.80

Del.quantity cm³/ : 12.6...12.8

100 s: (12.4...13.0)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 5.5...5.7

Del.quantity cm³/ : 1.9...2.3

100 s: (1.6...2.5)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1280

travel mm : 9.50...9.90

2nd speed rpm : 1250

travel mm : 7.50...7.70

3rd speed rpm : 350

travel mm : 5.20...5.80

4th speed rpm : 250

travel mm : 2.20...2.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 1200

Rack travel in mm : 14.70...16.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 126.0...128.0

1000 : (124.0...130.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 104...112

Setting point:

Speed rpm : 1200

Rack travel in mm : 15.5

Testing:

1st rack travel in: 13.30

Speed rpm : 1245...1260

2nd rack travel in: 4.00

Speed rpm : 1290...1320

4th rack travel in: 1450

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 70...78

Setting point w/out bumper spring

Speed rpm : 250

Rack travel in mm : 5.6

Testing:

Speed rpm : 100

Minimum rack trave: 7.00

Speed rpm : 250

Rack travel in mm : 5.50...5.70

TORQUE CONTROL

Dimension a mm : 0.30

Torque control curve - 1st version

1st speed rpm : 1000

Rack travel in m: 14.70...14.80

2nd speed rpm : 600

Rack travel in m: 14.80...14.90

3rd speed rpm : 800

Rack travel in m: 14.80...14.90

4th speed rpm : 1200

Rack travel in m: 14.30...14.40

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : 200

Rack travel mm : 12.70...12.80

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 12.30...12.40

2nd pressure hPa : 400

Rack travel in m: 13.80...14.10

3rd pressure hPa : 1000
Rack travel in m: 14.80...14.90

START CUT-OUT

Speed 1/min : 180 (200)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000

Speed rpm : 600

Del.quantity cm³/ 1000 s: 126.5...129.5
(124.0...132.0)

Spread cm³ : 5.00
1000 s: (7.0)

Aneroid pressure h: 1000

Speed rpm : 800

Del.quantity cm³/ 1000 s: 126.5...129.5
(124.0...132.0)

Aneroid pressure h: 1000

Speed rpm : 1200

Del.quantity cm³/ 1000 s: 123.0...126.0
(120.5...128.5)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm³/ 1000 s: 74.0...76.0
(72.0...78.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.30

Speed rpm : 1245...1260

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm³/ 1000 s: 130.0...140.0
(127.0...143.0)

LOW IDLE

Speed rpm : 250

Rack travel in mm : 5.50...5.70

Del.quantity cm³/ 1000 s: 19.0...23.0
(16.5...25.5)

Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

: MAN #3-7008#

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1

start of delivery



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 7,3 A
 Edition : 05.10.90
 Replaces : -
 Test oil : ISO-4113

Combination no. : Ü 403 456 112

Injection pump
 Pump designation : PES6MW100/321RS1190
 EP type number : 0 413 406 176
 Governor
 Governor design. : RQ250/1100MW84-5
 Governer no. : 0 420 082 046

Customer-spec. information
 Customer : MAN

Engine : D 0826 LOH05

1st version kW : 150.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 D47

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test Lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35
 : (3.20...3.40)

Rack travel in mm : 15.00...0.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 14.80...14.90

Del.quantity cm³/ : 13.2...13.4

100 s: (13.0...13.6)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 5.4...5.6

Del.quantity cm³/ : 1.9...2.3

100 s: (1.6...2.5)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1200

travel mm : 9.30...9.70

2nd speed rpm : 1100

travel mm : 7.30...7.50

3rd speed rpm : 470

travel mm : 6.70...7.30

4th speed rpm : 250

travel mm : 1.40...1.80

GUIDE SLEEVE POSITION

Control-lever position

Degree: 89

Speed rpm : 600

Rack travel in mm : 16.00...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 132.0...134.0

1000 : (130.0...136.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 86...94

Setting point:

Speed rpm : 600

Rack travel in mm : 16.9

Testing:

1st rack travel in: 13.80

Speed rpm : 1145...1160

2nd rack travel in: 4.00

Speed rpm : 1190...1220

4th rack travel in: 1250

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 50...58

Setting point w/out bumper spring

Speed rpm : 250

Rack travel in mm : 5.5

Testing:

Speed rpm : 100

Minimum rack trave: 7.00

Speed rpm : 250

Rack travel in mm : 5.40...5.60

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : 250

Rack travel mm : 12.60...12.70

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 11.90...12.00

2nd pressure hPa : 450

Rack travel in m: 13.70...14.00

3rd pressure hPa : 1000

Rack travel in m: 14.80...14.90

START CUT-OUT

Speed 1/min : 180 (200)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000

Speed rpm : 600
Del.quantity cm³/ 1000 s: 128.5...131.5
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: 1000
Speed rpm : 800
Del.quantity cm³/ 1000 s: 131.5...134.5
1000 s: (129.0...137.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ 1000 s: 74.0...76.0
1000 s: (72.0...78.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.80
Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ 1000 s: 130.0...140.0
1000 s: (127.0...143.0)

LOW IDLE

Speed rpm : 250
Rack travel in mm : 5.40...5.60
Del.quantity cm³/ 1000 s: 19.0...23.0
1000 s: (16.5...25.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

: MAN #3-7115#

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 C10
 Edition : 28.09.90
 Replaces : 01.12.90
 Test oil : ISO-4113
 Combination no. : 0 403 466 112
 Injection pump
 Pump designation : PES6MW100/120RS1137
 EP type number : 0 413 406 131
 Governor
 Governor design. : RSV425...1100MW2A319
 -8
 Governer no. : 0 420 085 104
 Customer-spec. information
 Customer : CUMMINS
 Engine : 6 CTA-8.3 L
 1st version kW : 188.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 047
 Inlet press., bar : 1.50
 Test nozzle holder assembly : 1 688 901 017
 Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,6
 Test Lines : 1 680 750 014

Outside diameter x Wall thickness x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60
 : (3.45...3.65)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 14.30...14.40

Del.quantity cm³/ : 14.9...15.1

100 s: (14.7...15.3)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 425.0
 Rack travel in mm : 7.7...7.9
 Del.quantity cm³/ : 1.9...2.3
 100 s: (1.6...2.5)
 Spread cm³ : 0.3
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension
 Click setting x : 2.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100
 Del.quantity : 149.0...151.0
 1000 : (147.0...153.0)
 Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version
 Control lever
 position degrees: 42...50

Setting point:

Speed rpm : 800
Rack travel in mm : 0.6

Testing:

1st rack travel in: 13.30
Speed rpm : 1160...1170
2nd rack travel in: 4.00
Speed rpm : 1235...1265
3rd rack travel in: 4.00
Speed rpm : 1245...1275
4th rack travel in: 1350
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 18...26
Setting point w/out bumper spring
Speed rpm : 425
Rack travel in mm : 7.3

Testing:

Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 425
Rack travel in mm : 7.20...7.40
Rack travel in mm : 2.00
Speed rpm : 490...550

TORQUE CONTROL

Dimension a mm : 1.00
Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 14.30...14.40
2nd speed rpm : 750
Rack travel in m: 15.30...15.40
3rd speed rpm : 900
Rack travel in m: 14.70...15.00

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750
Del.quantity cm³/ : 158.5...161.5
1000 s: (156.0...164.0)
Spread cm³ : 5.00
1000 s: (7.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.30
Speed rpm : 1160...1170

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 125.0...145.0
1000 s: (122.0...148.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 425
Rack travel in mm : 7.70...7.90
Del.quantity cm³/ : 19.0...23.0
1000 s: (16.5...25.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

: CDC #3915970#

Start-of-delivery mark at 10° cam
rotation angle after start of delivery,
cylinder 1

Starting/full-load transition speed
from holding magnet = 500 1/min.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 I 6
 Edition : 21.09.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 403 466 117JA
 Injection pump
 Pump designation : PES6MW100/120RS1178
 EP type number : 0 413 406 160
 Governor
 Governor design. : RSV350...1250MW2A332
 Governer no. : 0 420 085 152
 Customer-spec. information
 Customer : CUMMINS
 Engine : 6 CT
 1st version kW : 204.0
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 047
 Inlet press., bar : 1.50
 Test nozzle holder assembly : 1 688 901 017
 Opening pressure, bar : 207...210
 Orifice plate diameter mm : 0,6
 Test lines : 1 680 750 014
 Outside diameter x Wall thickness x Length mm : 6.00X2.00X600
 (A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.45...3.55
 : (3.40...3.60)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100
 Rack travel in mm : 14.10...14.20
 Del.quantity cm³/ : 15.4...15.6
 : 100 s: (15.2...15.8)

Spread cm³ : 0.3
 : 100 s: (0.6)

2nd speed rpm : 350.0
 Rack travel in mm : 6.2...6.4
 Del.quantity cm³/ : 2.0...2.4
 : 100 s: (1.7...2.6)

Spread cm³ : 0.3
 : 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension
 Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1100
 Aneroid pressure h: 900
 Del.quantity : 154.0...156.0
 : 1000 : (152.0...158.0)

Spread cm³ : 3.50
 : 1000 : (6.00)

RATED SPEED

1st version
 Control lever position degrees: 53...61

Setting point:
Speed rpm : 300
Rack travel in mm : 0.6

Testing:
1st rack travel in: 13.10
Speed rpm : 1160...1170
2nd rack travel in: 4.00
Speed rpm : 1295...1325
3rd rack travel in: 4.00
Speed rpm : 1315...1345
4th rack travel in: 1650
Speed rpm : 0.30...1.40

LOW IDLE 1
Control lever
position degrees: 30...38
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.8

Testing:
Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 350
Rack travel in mm : 5.70...5.90

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 14.10...14.20

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.60...10.80
2nd pressure hPa : 255
Rack travel in m: 11.60...11.80
3rd pressure hPa : 435
Rack travel in m: 13.00...13.40

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 88.5...92.5
1000 s: (86.5...94.5)

BREAKAWAY

1st version

E08

1mm rack travel less than
full load rack tr: 13.10
Speed rpm : 1160...1170

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 160.0...180.0
1000 s: (155.0...185.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 6.20...6.40
Del.quantity cm³/ : 20.0...24.0
1000 s: (17.5...26.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks: : CDC #3916293#

Start-of-delivery mark at 14° angular
displacement of the cam after start of
delivery of cylinder 1

Starting/full-load transition speed
from holding magnet = 500 1/min.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : LIE 8,4 E
 Edition : 05.11.90
 Replaces : -
 Test oil : ISO-4113

 Combination no. : 0 403 474 012

 Injection pump
 Pump designation : PES4MW100/720RS1207
 EP type number : 0 413 404 113
 Governor
 Governor design. : RSV350...1000MW0A333
 Governor no. : 0 420 085 153

 Customer-spec. information
 Customer : LIEBHERR

 Engine : D 914 T

 1st version kW : 110.0
 Rated speed : 2000

TEST BENCH REQUIREMENTS

 Test oil
 inlet temp. °C : 38...42

 Overflow valve : 1 417 413 049

 Inlet press., bar : 1.50

 Test nozzle holder
 assembly : 0 681 343 009

 Opening
 pressure, bar : 172...175

 Test Lines : 1 680 750 008

 Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

 (A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

 Prestroke mm : 3.30...3.40
 : (3.25...3.45)

Rack travel in mm : 9.00...12.00
 Firing order : 1-3-4-2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.50...11.60

Del.quantity cm³ : 13.3...13.5

100 s: (13.1...13.7)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.4...6.6

Del.quantity cm³ : 1.4...1.8

100 s: (1.1...2.0)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 133.0...135.0

1000 : (131.0...137.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 96...104

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:
 1st rack travel in: 10.50
 Speed rpm : 1040...1050
 2nd rack travel in: 4.00
 Speed rpm : 1110...1140
 4th rack travel in: 1275
 Speed rpm : 0.30...1.70

LOW IDLE 1
 Control lever
 position degrees: 72...80
 Setting point w/out bumper spring
 Speed rpm : 350
 Rack travel in mm : 6.5

Testing:
 Speed rpm : 100
 Minimum rack trave: 19.00
 Speed rpm : 350
 Rack travel in mm : 6.40...6.60
 Rack travel in mm : 2.00
 Speed rpm : 390...450

SET IDLE AUXILIARY SPRING
 Rack travel in mm : 2.00

TORQUE CONTROL
 Torque control curve - 1st version
 1st speed rpm : 1000
 Rack travel in m: 11.50...11.60
 2nd speed rpm : 700
 Rack travel in m: 11.50...11.60
 3rd speed rpm : 500
 Rack travel in m: 11.50...11.60

FUEL DELIVERY CHARACTERISTICS

1st version
 Speed rpm : 700
 Del.quantity cm³/ : 132.0...135.0
 1000 s: (129.5...137.5)
 Spread cm³ : 3.50
 1000 s: (7.0)

BREAKAWAY
1st version
 1mm rack travel less than
 full load rack tr: 10.50
 Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100
 Del.quantity cm³/ : 120.0...130.0
 1000 s: (117.0...133.0)

Rack travel in mm : 19.50...21.00
LOW IDLE
 Speed rpm : 350
 Rack travel in mm : 6.40...6.60
 Del.quantity cm³/ : 14.0...18.0
 1000 s: (11.5...20.5)
 Spread cm³ : 3.50
 1000 s: (5.00)

Remarks:
 :

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 98
 Edition : 14.09.90
 Replaces : -
 Test oil : ISO-4113

 Combination no. : 0 403 476 064B

 Injection pump
 Pump designation : PES6MW100/720RS1129
 EP type number : 0 413 406 121
 Governor
 Governor design. : RSV350...1300MWA329
 Governor no. : 0 420 085 095

 Customer-spec. information
 Customer : MB-NFZ

 Engine : OM 366 LA

 1st version kW : 132.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

 Test oil
 inlet temp. °C : 38...42

 Overflow valve : 1 417 413 047

 Inlet press., bar : 1.50

 Test nozzle holder assembly : 0 681 343 009

 Opening pressure, bar : 172...175

 Test lines : 1 680 750 015

 Outside diameter x Wall thickness x Length mm : 6.00X1.50X600

 (A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

 Prestroke mm : 3.70...3.80
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 10.00...10.10

Del.quantity cm³/ : 7.8...8.0

100 s: (7.6...8.2)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.5...5.7

Del.quantity cm³/ : 0.8...1.2

100 s: (0.6...1.4)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 900

Del.quantity : 78.0...80.0

1000 : (76.0...82.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 106...114

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 9.00

Speed rpm : 1240...1250

2nd rack travel in: 4.00

Speed rpm : 1285...1315
4th rack travel in: 1350
Speed rpm : 0.30...1.70

LOW IDLE 1
Control lever
position degrees: 72...80
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.6

Testing:
Speed rpm : 100
Minimum rack trave: 7.60
Speed rpm : 350
Rack travel in mm : 5.50...5.70

SET IDLE AUXILIARY SPRING
Rack travel in mm : 2.00

TORQUE CONTROL
Dimension a mm : 1.50
Torque control curve - 1st version
1st speed rpm : 1200
Rack travel in m: 10.00...10.10
2nd speed rpm : 600
Rack travel in m: 11.50...11.60
3rd speed rpm : 800
Rack travel in m: 10.90...11.10
4th speed rpm : 900
Rack travel in m: 10.50...10.70

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.50...9.60

Measurement
Speed 1/min : 500

1st pressure hPa : 175
Rack travel in m: 10.00...10.10
2nd pressure hPa : 300
Rack travel in m: 11.20...11.50
3rd pressure hPa : 900
Rack travel in m: 11.50...11.60

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 600
Del.quantity cm³/ : 81.0...84.0
1000 s: (78.5...86.5)

Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: 900
Speed rpm : 800
Del.quantity cm³/ : 82.0...85.0
1000 s: (79.5...87.5)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 48.0...50.0
1000 s: (46.0...52.0)

BREAKAWAY
1st version
1mm rack travel less than
full load rack tr: 9.00
Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 88.0...98.0
1000 s: (85.0...101.0)

LOW IDLE
Speed rpm : 350
Rack travel in mm : 5.50...5.70
Del.quantity cm³/ : 8.0...12.0
1000 s: (6.0...14.0)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:
:
Test hydr. locking device for starting
with 500...1000 hPa air pressure.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : LIE 8/4 D
 Edition : 17.09.90
 Replaces : -
 Test oil : ISO-4113

 Combination no. : 0 403 476 081

 Injection pump
 Pump designation : PES6MW100/720RS1196
 EP type number : 0 413 406 184
 Governor
 Governor design. : RSV350...1050MMOA338
 Governor no. : 0 420 085 138

 Customer-spec. information
 Customer : LIEBHERR

 Engine : D 916 T

 1st version kW : 170.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

 Test oil
 inlet temp. °C : 38...42

 Overflow valve : 1 417 413 049

 Inlet press., bar : 1.50

 Test nozzle holder assembly : 0 681 343 009

 Opening pressure, bar : 172...175

 Test lines : 1 680 750 008

 Outside diameter x Wall thickness x Length mm : 6.00x2.00x600

 (A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

 Prestroke mm : 3.40...3.50
 : (3.35...3.55)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.10...11.20

Del.quantity cm³/ : 13.3...13.5

100 s: (13.1...13.7)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 425.0

Rack travel in mm : 4.0...4.5

Del.quantity cm³/ : 1.4...1.8

100 s: (1.1...2.0)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 750

Del.quantity : 133.0...135.0

1000 : (131.0...137.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 98...106

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 10.10

Speed rpm : 1070...1080
2nd rack travel in: 3.00
Speed rpm : 1100...1120
4th rack travel in: 1200
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 68...76
Setting point w/out bumper spring
Speed rpm : 425
Rack travel in mm : 4.2

Testing:

Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 425
Rack travel in mm : 4.00...4.50

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

Aneroid/Altitude Compensator Test

1st version
Setting
Speed rpm : 550
Pressure hPa : -
Rack travel mm : 10.50...10.60

Measurement

Speed 1/min : 550

1st pressure hPa : 200
Rack travel in m: 10.70...10.80
2nd pressure hPa : 750
Rack travel in m: 11.10...11.20

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 750
Speed rpm : 500
Del.quantity cm³/ : 125.0...128.0
1000 s: (122.5...130.5)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: 750
Speed rpm : 800
Del.quantity cm³/ : 132.0...135.0
1000 s: (129.5...137.5)
Aneroid pressure h: -
Speed rpm : 550
Del.quantity cm³/ : 120.0...122.0
1000 s: (118.0...124.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 10.10
Speed rpm : 1070...1080

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 120.0...130.0
1000 s: (117.0...133.0)
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 425
Rack travel in mm : 4.00...4.50
Del.quantity cm³/ : 14.0...18.0
1000 s: (11.5...20.5)
Spread cm³ : 3.50
1000 s: (5.00)

Remarks:

:
Check electrically unlatched starting fuel delivery (EES) with 24 volt.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 7,2 X 1
 Edition : 17.09.90
 Replaces : 31.07.90
 Test oil : ISO-4113

 Combination no. : 0 403 476 082

 Injection pump
 Pump designation : PES6MW100/320RS1180-
 1
 EP type number : 0 413 406 193
 Governor
 Governor design. : RSV300...1100MW0A339
 Governor no. : 0 420 085 139

 Customer-spec. information
 Customer : MAN

 Engine : D0826LUE51/160

 1st version kW : 118.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

 Test oil
 inlet temp. °C : 38...42

 Overflow valve : 1 417 413 047

 Inlet press., bar : 1.50

 Test nozzle holder
 assembly : 0 681 343 009

 Opening
 pressure, bar : 172...175

 Test lines : 1 680 750 008

 Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

 (A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

 Prestroke mm : 3.50...3.60
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 10.10...10.20

Del.quantity cm³/ : 10.1...10.3

100 s: (9.9...10.5)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 4.2...4.4

Del.quantity cm³/ : 0.6...1.0

100 s: (0.4...1.2)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1000

Del.quantity : 101.0...103.0

1000 : (99.0...105.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 93...101

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 9.10
Speed rpm : 1150...1160
2nd rack travel in: 4.00
Speed rpm : 1190...1220
4th rack travel in: 1350
Speed rpm : 0.30...1.70

LOW IDLE 1
Control lever
position degrees: 70...78
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 4.3

Testing:
Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 300
Rack travel in mm : 4.20...4.40

SET IDLE AUXILIARY SPRING
Rack travel in mm : 2.00

TORQUE CONTROL
Dimension a mm : 0.70
Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 10.10...10.20
2nd speed rpm : 800
Rack travel in m: 10.80...10.90
3rd speed rpm : 600
Rack travel in m: 10.80...10.90

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 220
Rack travel mm : 9.60...9.70

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.30...9.40
2nd pressure hPa : 380
Rack travel in m: 10.50...10.80
3rd pressure hPa : 1000
Rack travel in m: 10.80...10.90

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1000
Speed rpm : 800

Del.quantity cm³/ : 109.5...112.5
1000 s: (107.0...115.0)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: 1000
Speed rpm : 600
Del.quantity cm³/ : 108.0...111.0
1000 s: (105.5...113.5)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 70.0...72.0
1000 s: (68.0...74.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 9.10
Speed rpm : 1150...1160

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 120.0...130.0
1000 s: (117.0...133.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 4.20...4.40
Del.quantity cm³/ : 6.0...10.0
1000 s: (4.0...12.0)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks: : MAN #3-7062#
Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a81
 Edition : 26.03.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 9 400 083 449AB
 Injection pump
 Pump designation : PES6A100D320/3RS2691
 EP type number : 9 410 230 025
 Governor
 Governor design. : RSV400...1100A2C2209
 R
 Governor no. : 9 420 083 201
 Cust. part no. : 3352892-VERSA001
 Customer-spec. information
 Customer : CUMMINS
 Engine : 6 CT 8.3
 1st version kW : 125.1
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 047
 Inlet press., bar : 1.50
 Test nozzle holder assembly : 0 681 343 009
 Opening pressure, bar : 172...175
 Test lines : 1 680 750 014
 Outside diameter x Wall thickness x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...7.95)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00
 & maximum rack tra: 21.00
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 10.70...10.80

Del.quantity cm³/

100 s: (9.1...9.7)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.4...5.6

Del.quantity cm³/

100 s: (1.0...1.9)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 93.0...95.0

1000 : (91.0...97.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 82...90

Spread cm³ : 3.50
1000 s: (5.50)

Testing:

1st rack travel in: 9.70
Speed rpm : 1040...1050
2nd rack travel in: 4.00
Speed rpm : 1075...1105
4th rack travel in: 1250
Speed rpm : 0.30...1.70

Remarks:

:
Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1

LOW IDLE 1

Control lever
position degrees: 62...70
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 5.0

Testing:

Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 400
Rack travel in mm : 5.40...5.60
Rack travel in mm : 2.00
Speed rpm : 530...590

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1000
Rack travel in m: 10.70...10.80
2nd speed rpm : 500
Rack travel in m: 10.70...10.90
5th speed rpm : 400
Rack travel in m: 11.10...11.60

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 9.70
Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 135.0...149.0
1000 s: (132.0...152.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 5.40...5.60
Del.quantity cm³/ : 13.0...17.0
1000 s: (10.5...19.5)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a75
 Edition : 26.03.90
 Replaces : -
 Test oil : ISO-4113

 Combination no. : 9 400 083 449AG

 Injection pump
 Pump designation : PES6A100D320/3RS2691
 EP type number : 9 410 230 025
 Governor
 Governor design. : RSV400...1100A2C2209
 R
 Governer no. : 9 420 083 201

 Cust. part no. : 3353251-VERSA006

 Customer-spec. information
 Customer : CUMMINS

 Engine : 6 CT 8.3

 1st version kW : 133.2
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

 Overflow valve : 1 417 413 047

 Inlet press., bar : 1.50

 Test nozzle holder assembly : 0 681 343 009

 Opening pressure, bar : 172...175

 Test lines : 1 680 750 014

 Outside diameter x Wall thickness x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...7.95)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00
 & maximum rack tra: 21.00
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 10.70...10.80

Del.quantity cm³/ : 9.6...9.8

100 s: (9.4...10.0)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 400.0
 Rack travel in mm : 5.1...5.3
 Del.quantity cm³/ : 1.0...1.4
 100 s: (0.7...1.6)
 Spread cm³ : 0.3
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension
 Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000
 Del.quantity : 96.0...98.0
 1000 : (94.0...100.0)
 Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 82...90

Testing:

1st rack travel in: 9.70
Speed rpm : 1040...1050
2nd rack travel in: 4.00
Speed rpm : 1070...1100
4th rack travel in: 1250
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 62...70
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 4.7

Testing:

Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 400
Rack travel in mm : 5.10...5.30
Rack travel in mm : 2.00
Speed rpm : 550...610

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1000
Rack travel in m: 10.70...10.80
2nd speed rpm : 500
Rack travel in m: 11.40...11.50
4th speed rpm : 835
Rack travel in m: 11.00...11.20

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 500
Del.quantity cm³/ : 95.0...98.0
1000 s: (92.5...100.5)
Speed rpm : 700
Del.quantity cm³/ : 103.0...106.0
1000 s: (100.5...108.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 9.70
Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm³/ : 135.0...149.0
1000 s: (132.0...152.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 5.10...5.30
Del.quantity cm³/ : 10.0...14.0
1000 s: (7.5...16.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:
Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a80
 Edition : 26.03.90
 Replaces : -
 Test oil : ISO-4113

 Combination no. : 9 400 083 449AI

 Injection pump
 Pump designation : PES6A100D320/3RS2691
 EP type number : 9 410 230 025
 Governor
 Governor design. : RSV400...1100A2C2209
 R
 Governor no. : 9 420 083 201

 Cust. part no. : 3352894-VERSA008

 Customer-spec. information
 Customer : CUMMINS

 Engine : 6 CT 8.3

 1st version kW : 139.8
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

 Overflow valve : 1 417 413 047

 Inlet press., bar : 1.50

 Test nozzle holder assembly : 0 681 343 009

Opening pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...7.95)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00
 & maximum rack tra: 21.00
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 11.10...11.20

Del.quantity cm³/ : 10.5...10.7

100 s: (10.3...10.9)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 400.0
 Rack travel in mm : 4.7...4.9
 Del.quantity cm³/ : 0.8...1.2
 100 s: (0.5...1.4)
 Spread cm³ : 0.3
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension
 Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250
 Del.quantity : 105.0...107.0

1000 : (103.0...109.0)

Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 90...98

Testing:

1st rack travel in: 10.10
Speed rpm : 1290...1300
2nd rack travel in: 4.00
Speed rpm : 1325...1355
4th rack travel in: 1500
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 61...69
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 4.3

Testing:

Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 400
Rack travel in mm : 4.70...4.90
Rack travel in mm : 2.00
Speed rpm : 510...570

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1250
Rack travel in m: 11.10...11.20
2nd speed rpm : 500
Rack travel in m: 11.10...11.30
5th speed rpm : 400
Rack travel in m: 11.50...12.00

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 10.10
Speed rpm : 1290...1300

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 135.0...149.0
1000 s: (132.0...152.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 4.70...4.90
Del.quantity cm³/ : 8.0...12.0
1000 s: (5.5...14.5)

Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:
Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a79
 Edition : 26.03.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 9 400 083 449BC
 Injection pump
 Pump designation : PES6A100D320/3RS2691
 EP type number : 9 410 230 025
 Governor
 Governor design. : RSV400...1100A2C2209
 R
 Governer no. : 9 420 083 201
 Cust. part no. : 3353232-VERSA012
 Customer-spec. information
 Customer : CUMMINS
 Engine : 6 CT 8.3
 1st version kW : 154.6
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 047
 Inlet press., bar : 1.50
 Test nozzle holder assembly : 0 681 343 009
 Opening pressure, bar : 172...175
 Test Lines : 1 680 750 014
 Outside diameter x Wall thickness x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...7.95)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00
 & maximum rack tra: 21.00
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.40...12.50

Del.quantity cm³/ : 12.0...12.2

100 s: (11.8...12.4)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.1...5.3

Del.quantity cm³/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension
 Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 120.0...122.0

1000 : (118.0...124.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 86...94

Spread cm³ : 3.50
 1000 s: (5.50)

Testing:

1st rack travel in: 11.40
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1185...1215
4th rack travel in: 1350
Speed rpm : 0.30...1.70

Remarks:

:
Start-of-delivery mark at 10° cam
rotation angle after start of delivery,
cylinder 1

LOW IDLE 1

Control lever
position degrees: 62...70
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 4.7

Testing:

Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 400
Rack travel in mm : 5.10...5.30
Rack travel in mm : 2.00
Speed rpm : 520...580

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 12.40...12.50
2nd speed rpm : 500
Rack travel in m: 12.40...12.60
5th speed rpm : 400
Rack travel in m: 12.80...13.30

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.40
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 135.0...149.0
 1000 s: (132.0...152.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 5.10...5.30
Del.quantity cm³/ : 10.0...14.0
 1000 s: (7.5...16.5)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a82
 Edition : 26.03.90
 Replaces : -
 Test oil : ISO-4113

 Combination no. : 9 400 083 449CI

 Injection pump
 Pump designation : PES6A100D320/3RS2691
 EP type number : 9 410 230 025
 Governor
 Governor design. : RSV400...1100A2C2209
 R
 Governor no. : 9 420 083 201

 Cust. part no. : 3354421-VERSA028

 Customer-spec. information
 Customer : CUMMINS

 Engine : 6 CT 8.3

 1st version kW : 154.6
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

 Overflow valve : 1 417 413 047

 Inlet press., bar : 1.50

 Test nozzle holder assembly : 0 681 343 009

 Opening pressure, bar : 172...175

 Test lines : 1 680 750 014

 Outside diameter x Wall thickness x Length mm : 6.00x2.00x600

 (A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...7.95)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00
 & maximum rack tra: 21.00
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.70...11.80

Del.quantity cm³/ : 11.5...11.7

100 s: (11.3...11.9)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 400.0
 Rack travel in mm : 5.2...5.4
 Del.quantity cm³/ : 1.1...1.5
 100 s: (0.8...1.7)
 Spread cm³ : 0.3
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension
 Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100
 Del.quantity : 115.0...117.0
 1000 : (113.0...119.0)
 Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 85...93

Spread cm³ : 3.50
1000 s: (5.50)

Testing:

1st rack travel in: 10.70
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1180...1210
4th rack travel in: 1350
Speed rpm : 0.30...1.70

Remarks:

:
Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1

LOW IDLE 1

Control lever
position degrees: 62...70
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 4.8

APPLICATION

Navy

Testing:

Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 400
Rack travel in mm : 5.20...5.40
Rack travel in mm : 2.00
Speed rpm : 525...585

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 11.70...11.80
2nd speed rpm : 500
Rack travel in m: 11.70...11.90
5th speed rpm : 400
Rack travel in m: 12.10...12.60

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 10.70
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 135.0...149.0
1000 s: (132.0...152.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 5.20...5.40
Del.quantity cm³/ : 11.0...15.0
1000 s: (8.5...17.5)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 P2
 Edition : 27.3.90
 replaces : -
 Calibrating oil : ISO 4113

Injection pump : VE 4/12F1100 R378-4
 Customer Part-No. : 3 917 033

Customer-specific information
 Customer : CDC

Engine : 4 BT 3.9 IND.

Power k: 59
 Speed 1/mi: 2200

TEST BENCH REQUIREMENTS

Calibrating-oil
 return temp. °C
 with thermometer : 40...48

Inlet press., bar : 0,35

Calibrating nozzle-holder
 assembly : 1 688 901 027

Opening pressure bar : 250...253

Perforated-plate
 diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
 x Wall thickness : 2
 x Length mm : 840

Start of delivery
 Prestroke mm : 0,3
 (from BDC): +0,02(0,04)

Start of delivery block
 Piston stroke mm: 1,8
 mm: +0,02(0,06)
 Outlet : A

Injection-pump setting values
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900
 Setting value mm: 2,3...2,7

Supply-pump pressure:

Speed 1/min: 900
 Setting value bar: 4,1...4,7

Full-load del. w/out charge press.:

Speed 1/min : 900
 Del.quantity cm³/
 1000H.: 58,5...59,5
 Dispersion cm³/ : 4,0
 1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375
 Del.quantity cm³/
 1000H.: 8,0...14,0
 Dispersion cm³/ : 5,5
 1000H.: 7,0

Full-load speed regulation:

Speed 1/min: 1140
 Del.quantity cm³/
 1000H: 45,0...51,0

Start:

Speed 1/min: 110
 Del.quantity : -
 mind cm³/1000H.: 50,0

Inspection-pump test specifications
 Test specifications in parentheses

Timing-device characteristic:

1st speed	1/min: 750
TD travel	mm: 1,3...2,1
	mm: 1,0...2,4
2nd speed	1/min: 900
TD travel	mm: 2,3...2,7
	mm: 1,8...2,2
3rd speed	1/min: 1100
TD travel	mm: 3,1...3,9
	mm: 2,8...4,2

Supply-pump pressure characteristic:

1st speed	1/min: 500
Supply-pump	pressure bar: 2,3...2,9
	bar: 2,1...3,1
2nd speed	1/min: 900

Supply-pump pressure	bar: 4,1...4,7 bar: 3,9...4,9	2nd speed 1/min: 500 Del.quantity cm ³ /: 0,0...4,0 1000H.: (-)
3rd speed	1/min: 1100	Automatic starting fuel delivery:
Supply-pump pressure	bar: 4,9...5,5 bar: 4,7...5,7	1st speed 1/min: 130 Del.quantity cm ³ /: - ind. 1000H: 80,0
Overflow quantity at overflow valve:		2nd speed 1/min: 240 Del.quantity cm ³ /: - max. 1000H : 80,0
1st speed	1/min: 500	Shutoff electromagnet:
Overflow	: 15...30	Cut-in min. voltage : 20,0 Rated voltage : 24,0
quantity	cm ³ /10s: -	Mounting and assembly dimensions:
2nd speed	1/min: 1100	Designation
Overflow	: 20...50	K mm : -
quantity	cm ³ /10s: -	KF mm : 5,0...5,4
Delivery-quant. and breakaway char.:		MS mm : 1,1...1,5
1st speed	1/min: 1210	SVS max. mm : 3,5
Del.quantity	cm ³ /: 0,00...15,0	XK mm : -
	1000H.: -	XL mm : -
2nd speed	1/min: 1170	Remarks: Heavy-duty fuel-injection pump for
Del.quantity	cm ³ /: 15,0...55,0	DI-engines: only test using timing- device-travel measuring device with
	1000H.: -	metal jacket
3rd speed	1/min: 1140	
Del.quantity	cm ³ /: 45,0...51,0	
	1000H.: 42,0...54,0	
4th speed	1/min: 1100	
Del.quantity	cm ³ /: 58,0...61,0	
	1000H.: 56,5...62,5	
5th speed	1/min: 900	
Del.quantity	cm ³ /: 58,5...59,5	
	1000H.: 56,0...62,0	
6th speed	1/min: 750	
Del.quantity	cm ³ /: 57,5...61,5	
	1000H.: 55,5...63,5	
7th speed	1/min: 500	
Del.quantity	cm ³ /: 50,0...58,0	
	1000H.: 48,0...60,0	
Zero delivery (stop):		
Mech. shutoff:		
Speed	1/min: 1100	
Del.quantity	cm ³ /: 0..3	
	1000H.: -	
Electr. shutoff:		
Speed	1/min: 375	
Del.quantity	cm ³ /: 0,0...3,0	
max.	1000H.: -	
Idle delivery:		
1st speed	1/min: 375	
Del.quantity	cm ³ /: 8,0...14,0	
	1000H.: (6,0...16,0)	

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 N24
 Edition : 31.10.90
 replaces : -
 Calibrating oil : ISO 4113
 Injection pump : VE 4/12F1100 R378-4
 Type number : 0 460 424 062
 Customer Part-No. : 3 917 554

Customer-specific information
 Customer : CDC

Engine : 4 BT 3.9 IND.

Power k: 68
 Speed 1/mi: 2200

TEST BENCH REQUIREMENTS

Calibrating-oil
 return temp. °C
 with thermometer : 40...48

Inlet press., bar : 0,35

Calibrating nozzle-holder
 assembly : 1 688 901 027

Opening pressure bar : 250...253

Perforated-plate
 diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
 x Wall thickness : 2
 x Length mm : 840

Start of delivery
 Prestroke mm : 0,3
 (from BDC) : +0,02(0,04)

Start of delivery block
 Piston stroke mm: 1,8
 mm: +0,02(0,06)
 Outlet : A

Injection-pump setting values
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900
 Setting value mm: 2,3...2,7

Supply-pump pressure:

Speed 1/min: 900
 Setting value bar: 4,1...4,7

Full-load del. w/out charge press.:

Speed 1/min : 900
 Del.quantity cm³/
 1000H.: 67,5...68,5
 Dispersion cm³/ : 4,0
 1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 450
 Del.quantity cm³/
 1000H.: 9,0...15,0
 Dispersion cm³/ : 5,5
 1000H.: 7,0

Full-load speed regulation:

Speed 1/min: 1160
 Del.quantity cm³/
 1000H.: 51,0...57,0

Start:

Speed 1/min: 110
 Del.quantity : -
 mind cm³/1000H.: 70,0

Inspection-pump test specifications
 Test specifications in parentheses

Timing-device characteristic:

1st speed	1/min: 750
TD travel	mm: 1,3...2,1
	mm: (1,0...2,4)
2nd speed	1/min: 900
TD travel	mm: 2,3...2,7
	mm: (1,8...2,2)
3rd speed	1/min: 1100
TD travel	mm: 3,1...3,9
	mm: (2,8...4,2)

Supply-pump pressure characteristic:

1st speed	1/min: 500
Supply-pump	pressure bar: 2,3...2,9
	bar: 2,1...3,1
2nd speed	1/min: 900

Supply-pump
pressure bar: 4,1...4,7

3rd speed 1/min: 1100

Supply-pump
pressure bar: 4,9...5,5

Overflow quantity at overflow valve:

1st speed 1/min: 500

Overflow : 41...83

quantity cm³/10s: (26...98)

2nd speed 1/min: 1100

Overflow : 55...138

quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1230

Del.quantity cm³: 0,0...1,0

1000H.: -

2nd speed 1/min: 1175

Del.quantity cm³: 15,0...55,0

1000H.: -

3rd speed 1/min: 1160

Del.quantity cm³: 51,0...57,0

1000H.: (48,0...60,0)

4th speed 1/min: 1100

Del.quantity cm³: 65,5...68,5

1000H.: (64,0...70,0)

5th speed 1/min: 900

Del.quantity cm³: 67,5...68,5

1000H.: (65,0...71,0)

6th speed 1/min: 750

Del.quantity cm³: 70,0...74,0

1000H.: (68,0...76,0)

7th speed 1/min: 500

Del.quantity cm³: 74,0...82,0

1000H.: (72,0...84,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100

Del.quantity cm³: 0..3

1000H.: -

Electr. shutoff:

Speed 1/min: 450

Del.quantity cm³: 0,0...3,0

max. 1000H.: -

Idle delivery:

1st speed 1/min: 450

Del.quantity cm³: 9,0...15,0

1000H.: (7,0...17,0)

2nd speed 1/min: 530

Del.quantity cm³: 0,0...3,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130

Del.quantity cm³: -

ind. 1000H: 80,0

2nd speed 1/min: 240

Del.quantity cm³: -

max. 1000H : 80,0

Shutoff electromagnet:

Cut-in

min. voltage : 10,0

Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,0...5,4
MS	mm	:	1,1...1,5
SVS max.	mm	:	3,5
XK	mm	:	-
XL	mm	:	-

Remarks:

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 P2
 Edition : 31.10.90
 replaces : 14.07.90
 Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R159-16
 Type number : 0 460 426 066
 Customer Part-No. : 3 908 214

Customer-specific information
 Customer : CDC

Engine : 6 BT 5.9 IND

TEST BENCH REQUIREMENTS

Calibrating-oil
 return temp. °C
 with thermometer : 40...48
 electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
 assembly : 1 688 901 027

Opening
 pressure bar : 250...253

Perforated-plate
 diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
 x Wall thickness : 2
 x Length mm : 840

Start of delivery
 Prestroke mm : 0,3
 (from BDC): +0,02(0,04)

Start of delivery block
 Piston stroke mm: 1,3
 mm: +0,02(0,06)
 Outlet : 0

Injection-pump setting values
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750

Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750
 Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

Speed 1/min : 1100
 Del.quantity cm³/
 1000H.: 73,0...74,0
 Dispersion cm³/: 4,0
 1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 360
 Del.quantity cm³/
 1000H.: 8,0...14,0
 Dispersion cm³/: 5,5
 1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1300
 Del.quantity cm³/
 1000H: 51,0...57,0

Start:

Speed 1/min: 100
 Del.quantity : -
 mind cm³/1000H.: 60,0

Inspection-pump test specifications
 Test specifications in parentheses

Timing-device characteristic:

1st speed	1/min: 500
TD travel	mm: 1,5...2,3
	mm: (1,2...2,6)
2nd speed	1/min: 750
TD travel	mm: 3,4...3,8
	mm: (2,9...4,3)
3rd speed	1/min: 1100
TD travel	mm: 5,2...6,0
	mm: (4,9...6,3)

Supply-pump pressure characteristic:

1st speed	1/min: 500
Supply-pump	pressure bar: 2,4...3,0
2nd speed	1/min: 750
Supply-pump	pressure bar: 3,5...4,1
3rd speed	1/min: 1100

Supply-pump
pressure bar: 4,8...5,4

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1250
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1400
Del.quantity cm³: 0,0...3,0
1000H.: -
2nd speed 1/min: 1390
Del.quantity cm³: 0,0...15,0
1000H.: -
3rd speed 1/min: 1350
Del.quantity cm³: 15,0...55,0
1000H.: -
4th speed 1/min: 1300
Del.quantity cm³: 51,0...57,0
1000H.: (48,0...60,0)
5th speed 1/min: 1250
Del.quantity cm³: 70,0...73,0
1000H.: (68,5...74,5)
6th speed 1/min: 1100
Del.quantity cm³: 73,0...74,0
1000H.: (70,5...76,5)
7th speed 1/min: 900
Del.quantity cm³: 74,5...78,5
1000H.: -
8th speed 1/min: 750
Del.quantity cm³: 76,0...80,0
1000H.: (74,0...82,0)
9th speed 1/min: 500
Del.quantity cm³: 64,0...72,0
1000H.: (62,0...74,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
Del.quantity cm³: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 360
ELAB volt: -
Del.quantity cm³: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 360

Del.quantity cm³: 8,0...14,0
1000H.: (6,0...16,0)
2nd speed 1/min: 450
Del.quantity cm³: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³: -
ind. 1000H: 70,0

2nd speed 1/min: 240
Del.quantity cm³: -
max. 1000H: 70,0

Shutoff electromagnet:

Cut-in
min. voltage : 20,0
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,0...5,4
MS	mm	:	0,6...1,0
SVS max.	mm	:	1,5
XK	mm	:	18,8...20,8
XL	mm	:	11,1...14,5

Remarks:

:
Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 P1
 Edition : 31.10.90
 replaces : 02.11.89
 Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R159-16
 Type number : 0 460 426 066

Customer-specific information
 Customer : CDC

Engine : 6BT-5.9 IND.

TEST BENCH REQUIREMENTS

Calibrating-oil
 return temp. °C
 with thermometer : 40...48
 electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
 assembly : 1 688 901 027

Opening
 pressure bar : 250...253

Perforated-plate
 diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
 x Wall thickness : 2
 x Length mm : 840

Start of delivery
 Prestroke mm : 0,3
 (from BDC) : +0,02(0,04)

Start of delivery block
 Piston stroke mm: 1,3
 mm: +0,02(0,06)
 Outlet : D

Injection-pump setting values
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
 Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750
 Setting value bar: 3,5...4,1

Full-load del. with charge press.:

Speed 1/min: 1100
 Del.quantity cm³/
 1000H.: 73,0...74,0
 Dispersion cm³/ : 4,6
 1000H. : (4,5)

Low-idle speed regulation:

Speed 1/min: 360
 Del.quantity cm³/
 1000H.: 8,0...14,0
 Dispersion cm³/ : 5,5
 1000H. : (7,0)

Full-load speed regulation:

Speed 1/min: 1300
 Del.quantity cm³/
 1000H. : 51,0...57,0

Start:

Speed 1/min: 100
 Del.quantity : -
 mind cm³/1000H. : 60,0

Inspection-pump test specifications
 Test specifications in parentheses

Timing-device characteristic:

1st speed	1/min: 500
TD travel	mm: 1,5...2,3
	mm: (1,2...2,6)
2nd speed	1/min: 750
TD travel	mm: 3,4...3,8
	mm: (2,9...4,3)
3rd speed	1/min: 1100
TD travel	mm: 5,2...6,0
	mm: (4,9...6,3)

Supply-pump pressure characteristic:

1st speed	1/min: 500
Supply-pump pressure	bar: 2,4...3,0
2nd speed	1/min: 750
Supply-pump pressure	bar: 3,5...4,1
3rd speed	1/min: 1100

Supply-pump
pressure bar: 4,8...5,4

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow quantity cm³/10s: 41...83
2nd speed 1/min: 1250
Overflow quantity cm³/10s: 55...138
 (26...98)
 (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1400
Del.quantity cm³/: 0,0...3,0
 1000H.: -
2nd speed 1/min: 1390
Del.quantity cm³/: 0,0...15,0
 1000H.: -
3rd speed 1/min: 1350
Del.quantity cm³/: 15,0...55,0
 1000H.: -
4th speed 1/min: 1300
Del.quantity cm³/: 51,0...57,0
 1000H.: (48,0...60,0)
5th speed 1/min: 1250
Del.quantity cm³/: 70,0...73,0
 1000H.: (68,5...74,5)
6th speed 1/min: 1100
Del.quantity cm³/: 73,0...74,0
 1000H.: (70,5...76,5)
7th speed 1/min: 900
Del.quantity cm³/: 74,5...78,5
 1000H.: -
8th speed 1/min: 750
Del.quantity cm³/: 76,0...80,0
 1000H.: (74,0...82,0)
9th speed 1/min: 500
Del.quantity cm³/: 64,0...72,0
 1000H.: (62,0...74,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
Del.quantity cm³/: -
 1000H.: 0..3

Electr. shutoff:

Speed 1/min: 360
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 360

Del.quantity cm³/: 8,0...14,0
 1000H.: (6,0...16,0)
2nd speed 1/min: 450
Del.quantity cm³/: 0,0...4,0
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H: 70,0
2nd speed 1/min: 240
Del.quantity cm³/: -
max. 1000H : 70,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation	
K	mm : -
KF	mm : 5,0...5,4
MS	mm : 0,6...1,0
SVS max.	mm : 0,9
XK	mm : 18,8...20,8
XL	mm : 11,8...15,2

Remarks:

: C.D.C. # 390 8198
Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 P3
 Edition : 31.10.90
 replaces : 02.11.89
 Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R159-16
 Type number : 0 460 426 066
 Customer Part-No. : 3 916 114

Customer-specific information
 Customer : CDC

Engine : 6BT-5.9 IND.

TEST BENCH REQUIREMENTS

Calibrating-oil
 return temp. °C
 with thermometer : 40...48
 electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
 assembly : 1 688 901 027

Opening
 pressure bar : 250...253

Perforated-plate
 diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
 x Wall thickness : 2
 x Length mm : 840

Start of delivery
 Prestroke mm : 0,3
 (from BDC) : +0,02(0,04)

Start of delivery block
 Piston stroke mm: 1,3
 mm: +0,02(0,04)
 Outlet : D

Injection-pump setting values
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750

Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750
 Setting value bar: 3,5...4,1

Full-load del. with charge press.:

Speed 1/min: 1100
 Del.quantity cm³/
 1000H.: 73,0...74,0
 Dispersion cm³/ : 4,0
 1000H : (4,5)

Low-idle speed regulation:

Speed 1/min: 360
 Del.quantity cm³/
 1000H.: 8,0...14,0
 Dispersion cm³/ : 5,5
 1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1300
 Del.quantity cm³/
 1000H: 51,0...57,0

Start:

Speed 1/min: 100
 Del.quantity : -
 mind cm³/1000H.: 60,0

Inspection-pump test specifications
 Test specifications in parentheses

Timing-device characteristic:

1st speed	1/min: 500
TD travel	mm: 1,5...2,3
	mm: (1,2...2,6)
2nd speed	1/min: 750
TD travel	mm: 3,4...3,8
	mm: (2,9...4,3)
3rd speed	1/min: 1100
TD travel	mm: 5,2...6,0
	mm: (4,9...6,3)

Supply-pump pressure characteristic:

1st speed	1/min: 500
Supply-pump pressure	bar: 2,4...3,0
2nd speed	1/min: 750
Supply-pump pressure	bar: 3,5...4,1
3rd speed	1/min: 1100

Supply-pump
pressure bar: 4,8...5,4

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1250
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1400
Del.quantity cm³: 0,0...3,0
1000H.: -
2nd speed 1/min: 1390
Del.quantity cm³: 0,0...15,0
1000H.: -
3rd speed 1/min: 1350
Del.quantity cm³: 15,0...55,0
1000H.: -
4th speed 1/min: 1300
Del.quantity cm³: 51,0...57,0
1000H.: (48,0...60,0)
5th speed 1/min: 1250
Del.quantity cm³: 70,0...73,0
1000H.: (68,5...74,5)
6th speed 1/min: 1100
Del.quantity cm³: 73,0...74,0
1000H.: (70,5...76,5)
7th speed 1/min: 900
Del.quantity cm³: 74,5...78,5
1000H.: -
8th speed 1/min: 750
Del.quantity cm³: 76,0...80,0
1000H.: (74,0...82,0)
9th speed 1/min: 500
Del.quantity cm³: 64,0...72,0
1000H.: (62,0...74,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
Del.quantity cm³: -
1000H.: 0..3

Electr. shutoff:

Speed 1/min: 360
ELAB volt: -
Del.quantity cm³: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 360

Del.quantity cm³: 7,0...15,0
1000H.: (6,0...16,0)
2nd speed 1/min: 450
Del.quantity cm³: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³: -
ind. 1000H: 70,0
2nd speed 1/min: 240
Del.quantity cm³: -
max. 1000H: 70,0

Shutoff electromagnet:

Cut-in
min. voltage : 20,0
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation	mm	:	-
K	mm	:	5,0...5,4
KF	mm	:	0,6...1,0
SVS max.	mm	:	0,9
XK	mm	:	18,8...20,8
XL	mm	:	11,8...15,2

Remarks: : C.D.C. # 3 908 198

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 S
 Edition : 31.10.90
 replaces : 11.12.86
 Calibrating oil : ISO 4113
 Injection pump : VE 6/12F1150 R225-4
 Type number : 0 460 426 071

Customer-specific information
 Customer : CDC

Engine : 6BT-5.9

TEST BENCH REQUIREMENTS

Calibrating-oil
 return temp. °C
 with thermometer : 40...48
 electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
 assembly : 1 688 901 027

Opening
 pressure bar : 250...253

Perforated-plate
 diameter mm : 0.5

Test inj. tubing : 1 680 750 027

Outside diameter : 6
 x Wall thickness : 2
 x Length mm : 840

Start of delivery
 Prestroke mm : 0,3
 (from BDC): +0,02(0,04)

Start of delivery block
 Piston stroke mm: 1,3
 mm: +0,02(0,06)

Outlet : D

Injection-pump setting values
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
 Setting value mm: 3,5...3,9

Supply-pump pressure:

Speed 1/min: 750
 Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

Speed 1/min : 900
 Del.quantity cm³/
 1000H.: 71,5...72,5
 Dispersion cm³/ : 4,0
 1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375
 Del.quantity cm³/
 1000H.: 9,0...15,0
 Dispersion cm³/ : 5,5
 1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1190
 Del.quantity cm³/
 1000H: 54,0...60,0

Start:

Speed 1/min: 100
 Del.quantity : -
 mind cm³/1000H.: 60,0

Inspection-pump test specifications
 Test specifications in parentheses

Timing-device characteristic:

1st speed	1/min: 500
TD travel	mm: 1,5...2,3
	mm: (1,2...2,6)
2nd speed	1/min: 750
TD travel	mm: 3,5...3,9
	mm: (3,0...4,4)
3rd speed	1/min: 1100
TD travel	mm: 5,4...6,2
	mm: (5,1...6,5)

Supply-pump pressure characteristic:

1st speed	1/min: 500
Supply-pump	pressure
	bar: 2,4...3,0
2nd speed	1/min: 750
Supply-pump	pressure
	bar: 3,5...4,1
3rd speed	1/min: 1100

Supply-pump
pressure bar: 4,8...5,4

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1150
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1300
Del.quantity cm³: 0,0...2,0
1000H.: -
2nd speed 1/min: 1260
Del.quantity cm³: 0,0...15,0
1000H.: -
3rd speed 1/min: 1190
Del.quantity cm³: 54,0...60,0
1000H.: (51,0...63,0)
4th speed 1/min: 1150
Del.quantity cm³: 66,5...69,5
1000H.: (65,0...71,0)
5th speed 1/min: 900
Del.quantity cm³: 71,5...72,5
1000H.: (69,0...75,0)
6th speed 1/min: 750
Del.quantity cm³: 72,0...76,0
1000H.: (70,0...78,0)
7th speed 1/min: 500
Del.quantity cm³: 58,0...66,0
1000H.: (56,0...68,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1150
Del.quantity cm³: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³: 9,0...15,0
1000H.: (7,0...17,0)
2nd speed 1/min: 450
Del.quantity cm³: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³: -
ind. 1000H: 70,0

2nd speed 1/min: 240
Del.quantity cm³: -
max. 1000H : 70,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,0...5,4
MS	mm	:	0,8...1,2
SVS max.	mm	:	1,0
XK	mm	:	20,2...22,2
XL	mm	:	11,5...14,9

Remarks:

: C.D.C. # 3 903 367
Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 S1
 Edition : 31.10.90
 replaces : -
 Calibrating oil : ISO 4113

Injection pump : VE 6/12F1150 R225-4
 Type number : 0 460 426 071
 Customer Part-No. : 3 910 250

Customer-specific information
 Customer : CDC

Engine : 6BT-5.9

TEST BENCH REQUIREMENTS

Calibrating-oil
 return temp. °C
 with thermometer : 40...48
 electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
 assembly : 1 688 901 027

Opening pressure bar : 250...253

Perforated-plate
 diameter mm : 0,5

Test inj. tubing : 1 680 750 027

Outside diameter : 6
 x Wall thickness : 2
 x Length mm : 840

Start of delivery
 Prestroke mm : 0,3
 (from BDC) : +0,02(0,04)

Start of delivery block
 Piston stroke mm : 1,3
 mm : +0,02(0,06)
 Outlet : D

Injection-pump setting values
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750

Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750
 Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

Speed 1/min : 900
 Del.quantity cm³/
 1000H.: 71,5...72,5
 Dispersion cm³/: 4,0
 1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375
 Del.quantity cm³/
 1000H.: 8,0...14,0
 Dispersion cm³/: 5,5
 1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1190
 Del.quantity cm³/
 1000H.: 50,0...56,0

Start:

Speed 1/min: 100
 Del.quantity : -
 mind cm³/1000H.: 60,0

Inspection-pump test specifications
 Test specifications in parentheses

Timing-device characteristic:

1st speed	1/min: 500
TD travel	mm: 1,5...2,3
	mm: (1,2...2,6)
2nd speed	1/min: 750
TD travel	mm: 3,4...3,8
	mm: (2,9...4,3)
3rd speed	1/min: 1100
TD travel	mm: 5,2...6,0
	mm: (4,9...6,3)

Supply-pump pressure characteristic:

1st speed	1/min: 500
Supply-pump	pressure bar: 2,4...3,0
2nd speed	1/min: 750
Supply-pump	pressure bar: 3,5...4,1
3rd speed	1/min: 1100

Supply-pump
pressure bar: 4,8...5,4

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow quantity cm³/10s: 41...83
2nd speed 1/min: 1150
Overflow quantity cm³/10s: 55...138
 (26...98)
 (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1300
Del.quantity cm³/: 1,5...4,5
 1000H.: -
2nd speed 1/min: 1220
Del.quantity cm³/: 15,0...55,0
 1000H.: -
3rd speed 1/min: 1190
Del.quantity cm³/: 50,0...56,0
 1000H.: (47,0...59,0)
4th speed 1/min: 1150
Del.quantity cm³/: 66,5...69,5
 1000H.: (65,0...71,0)
5th speed 1/min: 900
Del.quantity cm³/: 71,5...72,5
 1000H.: (69,0...75,0)
6th speed 1/min: 750
Del.quantity cm³/: 71,0...75,0
 1000H.: (69,0...77,0)
7th speed 1/min: 500
Del.quantity cm³/: 58,0...66,0
 1000H.: (56,0...68,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1150
Del.quantity cm³/: 0..3
 1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 8,0...14,0
 1000H.: (6,0...16,0)
2nd speed 1/min: 450
Del.quantity cm³/: 0,0...4,0
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H: 60,0

2nd speed 1/min: 240
Del.quantity cm³/: -
max. 1000H : 60,0

Shutoff electromagnet:

Cut-in
min. voltage : 20,0
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation	mm	:	-
K	mm	:	5,0...5,4
KF	mm	:	0,8...1,2
MS	mm	:	1,0
SVS max.	mm	:	20,2...22,2
XK	mm	:	11,5...14,9
XL	mm	:	

Remarks:

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 S6
 Edition : 31.10.90
 replaces : -
 Calibrating oil : ISO 4113

Injection pump : VE 6/12F1150 R225-4
 Type number : 0 460 426 071
 Customer Part-No. : 3 916 115

Customer-specific information
 Customer : CDC

Engine : 6BT-5.9

TEST BENCH REQUIREMENTS

Calibrating-oil
 return temp. °C
 with thermometer : 40...48
 electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
 assembly : 1 688 901 027

Opening
 pressure bar : 250...253

Perforated-plate
 diameter mm : 0,5

Test inj. tubing : 1 680 750 027

Outside diameter : 6
 x Wall thickness : 2
 x Length mm : 840

Start of delivery
 Prestroke mm : 0,3
 (from BDC) : +0,02(0,04)

Start of delivery block
 Piston stroke mm : 1,3
 mm: +0,02(0,06)
 Outlet : 0

Injection-pump setting values
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750

Setting value mm: 3,5...3,9

Supply-pump pressure:

Speed 1/min: 750
 Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

Speed 1/min : 900
 Del.quantity cm³/
 1000H.: 71,5...72,5
 Dispersion cm³/ : 4,0
 1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375
 Del.quantity cm³/
 1000H.: 9,0...15,0
 Dispersion cm³/ : 5,5
 1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1190
 Del.quantity cm³/
 1000H: 54,0...60,0

Start:

Speed 1/min: 100
 Del.quantity : -
 mind cm³/1000H.: 60,0

Inspection-pump test specifications
 Test specifications in parentheses

Timing-device characteristic:

1st speed	1/min: 500
TD travel	mm: 1,5...2,3
	mm: (1,2...2,6)
2nd speed	1/min: 750
TD travel	mm: 3,5...3,9
	mm: (3,0...4,4)
3rd speed	1/min: 1100
TD travel	mm: 5,4...6,2
	mm: (5,1...6,5)

Supply-pump pressure characteristic:

1st speed	1/min: 500
Supply-pump pressure	bar: 2,4...3,0
2nd speed	1/min: 750
Supply-pump pressure	bar: 3,5...4,1
3rd speed	1/min: 1100

Supply-pump
pressure bar: 4,8...5,4

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1150
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1300
Del.quantity cm³: 1,0...3,0
1000H.: -
2nd speed 1/min: 1260
Del.quantity cm³: 0,0...15,0
1000H.: -
3rd speed 1/min: 1190
Del.quantity cm³: 54,0...60,0
1000H.: (51,0...63,0)
4th speed 1/min: 1150
Del.quantity cm³: 66,5...69,5
1000H.: (65,0...71,0)
5th speed 1/min: 900
Del.quantity cm³: 71,5...72,5
1000H.: (69,0...75,0)
6th speed 1/min: 750
Del.quantity cm³: 72,0...76,0
1000H.: (70,0...78,0)
7th speed 1/min: 500
Del.quantity cm³: 58,0...66,0
1000H.: (56,0...68,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1150
Del.quantity cm³: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³: 9,0...15,0
1000H.: (7,0...17,0)
2nd speed 1/min: 450
Del.quantity cm³: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³: -
ind. 1000H: 70,0

2nd speed 1/min: 240
Del.quantity cm³: -
max. 1000H : 70,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,0...5,4
MS	mm	:	0,8...1,2
SVS max.	mm	:	1,0
XK	mm	:	20,2...22,2
XL	mm	:	11,5...14,9

Remarks:

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 S5
 Edition : 31.10.90
 replaces : -
 Calibrating oil : ISO 4113

Injection pump : VE 6/12F1150 R225-4
 Type number : D 460 426 071
 Customer Part-No. : 3 916 116

Customer-specific information
 Customer : CDC

Engine : 6BT-5.9

TEST BENCH REQUIREMENTS

Calibrating-oil
 return temp. °C

with thermometer : 40...48
 electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
 assembly : 1 688 901 027

Opening pressure bar : 250...253

Perforated-plate
 diameter mm : 0.5

Test inj. tubing : 1 680 750 027

Outside diameter : 6
 x Wall thickness : 2
 x Length mm : 840

Start of delivery
 Prestroke mm : 0,3
 (from BDC) : +0,02(0,04)

Start of delivery block
 Piston stroke mm: 1,3
 mm: +0,02(0,06)
 Outlet : 0

Injection-pump setting values
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750

Setting value mm: 3,5...3,9

Supply-pump pressure:

Speed 1/min: 750
 Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

Speed 1/min : 900
 Del.quantity cm³/
 1000H.: 71,5...72,5
 Dispersion cm³/ : 4,0
 1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375
 Del.quantity cm³/
 1000H.: 9,0...15,0
 Dispersion cm³/ : 5,5
 1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1190
 Del.quantity cm³/
 1000H: 54,0...60,0

Start:

Speed 1/min: 100
 Del.quantity : -
 mind cm³/1000H.: 60,0

Inspection-pump test specifications
 Test specifications in parentheses

Timing-device characteristic:

1st speed	1/min: 500
TD travel	mm: 1,5...2,3
	mm: (1,2...2,6)
2nd speed	1/min: 750
TD travel	mm: 3,5...3,9
	mm: (3,0...4,4)
3rd speed	1/min: 1100
TD travel	mm: 5,4...6,2
	mm: (5,1...6,5)

Supply-pump pressure characteristic:

1st speed	1/min: 500
Supply-pump	pressure bar: 2,4...3,0
2nd speed	1/min: 750
Supply-pump	pressure bar: 3,5...4,1
3rd speed	1/min: 1100

Supply-pump
pressure bar: 4,8...5,4

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1150
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1300
Del.quantity cm³/: 1,0...3,0
1000H.: -
2nd speed 1/min: 1260
Del.quantity cm³/: 0,0...15,0
1000H.: -
3rd speed 1/min: 1190
Del.quantity cm³/: 54,0...60,0
1000H.: (51,0...63,0)
4th speed 1/min: 1150
Del.quantity cm³/: 66,5...69,5
1000H.: (65,0...71,0)
5th speed 1/min: 900
Del.quantity cm³/: 71,5...72,5
1000H.: (69,0...75,0)
6th speed 1/min: 750
Del.quantity cm³/: 72,0...76,0
1000H.: (70,0...78,0)
7th speed 1/min: 500
Del.quantity cm³/: 58,0...66,0
1000H.: (56,0...68,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1150
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 9,0...15,0
1000H.: (7,0...17,0)
2nd speed 1/min: 450
Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H: 70,0

2nd speed 1/min: 240
Del.quantity cm³/: -
max. 1000H : 70,0

Shutoff electromagnet:

Cut-in
min. voltage : 20,0
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation	mm	:	-
K	mm	:	5,0...5,4
KF	mm	:	0,8...1,2
MS	mm	:	1,0
SVS max.	mm	:	20,2...22,2
XK	mm	:	11,5...14,9
XL	mm	:	

Remarks:

:
Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W70
 Edition : 31.10.90
 replaces : -
 Calibrating oil : ISO 4113
 Injection pump : VE 6/12F1100 R225-22
 Type number : 0 460 426 132
 Customer Part-No. : 3 919 457

Customer-specific information
 Customer : CDC

Engine : 6 BTA

TEST BENCH REQUIREMENTS

Calibrating-oil
 return temp. °C
 with thermometer : 40...48
 electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
 assembly : 1 688 901 027

Opening
 pressure bar : 250...253

Perforated-plate
 diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
 x Wall thickness : 2
 x Length mm : 840

Start of delivery
 Prestroke mm : 0,3
 (from BDC): +0,02(0,04)

Start of delivery block
 Piston stroke mm: 1,85
 mm: +0,02(0,06)

Outlet : 0

Injection-pump setting values
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900

Setting value mm: 2,4...2,8

Supply-pump pressure:

Speed 1/min: 900
 Setting value bar: 3,8...4,4

Full-load del. w/out charge press.:

Speed 1/min : 750
 Del.quantity cm³/ 1000H.: 92,0...93,0
 Dispersion cm³/ 1000H.: 4,0
 1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 480
 Del.quantity cm³/ 1000H.: 11,0...17,0

Full-load speed regulation:

Speed 1/min: 1190
 Del.quantity cm³/ 1000H.: 15,0...25,0

Start:

Speed 1/min: 100
 Del.quantity : -
 mind cm³/1000H.: 70,0

Inspection-pump test specifications
 Test specifications in parentheses

Timing-device characteristic:

1st speed	1/min: 750
TD travel	mm: 1,3...2,1
	mm: (1,0...2,4)
2nd speed	1/min: 900
TD travel	mm: 2,4...2,8
	mm: (1,9...3,3)
3rd speed	1/min: 1100
TD travel	mm: 3,0...3,8
	mm: (2,7...4,1)

Supply-pump pressure characteristic:

1st speed	1/min: 500
Supply-pump pressure	bar: 2,2...2,8
2nd speed	1/min: 750
Supply-pump pressure	bar: 3,2...3,8
3rd speed	1/min: 900
Supply-pump pressure	bar: 3,8...4,4

4th speed 1/min: 1100

Supply-pump pressure bar: 4,6...5,2

Overflow quantity at overflow valve:

1st speed 1/min: 500

Overflow quantity cm³/10s: 41...83
(26...98)

2nd speed 1/min: 1100

Overflow quantity cm³/10s: 55...138
(40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1250

Del.quantity cm³/: 0,0...3,0
1000H.: -

2nd speed 1/min: 1230

Del.quantity cm³/: 0,0...15,0
1000H.: -

3rd speed 1/min: 1190

Del.quantity cm³/: 15,0...25,0
1000H.: -

4th speed 1/min: 1100

Del.quantity cm³/: 75,0...78,0
1000H.: (73,5...79,5)

5th speed 1/min: 900

Del.quantity cm³/: 80,5...83,5
1000H.: (78,5...85,5)

6th speed 1/min: 750

Del.quantity cm³/: 92,0...93,0
1000H.: (89,5...95,5)

7th speed 1/min: 500

Del.quantity cm³/: 91,0...101,0
1000H.: (90,0...102,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100

Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 480

ELAB volt: -

Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 480

Del.quantity cm³/: 11,0...17,0
1000H.: (9,0...19,0)

2nd speed 1/min: 550

Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130

Del.quantity cm³/: -
ind. 1000H: 70,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,1...5,5
MS	mm	:	0,8...1,2
SVS max.	mm	:	2,2
XK	mm	:	18,8...20,8
XL	mm	:	11,9...15,3

Remarks:

:
Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W69
 Edition : 31.10.90
 replaces : -
 Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R225-22
 Type number : 0 460 426 132
 Customer Part-No. : 3 919 458

Customer-specific information
 Customer : CDC

Engine : 6 BTA

TEST BENCH REQUIREMENTS

Calibrating-oil
 return temp. °C
 with thermometer : 40...48
 electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
 assembly : 1 688 901 027

Opening
 pressure bar : 250...253

Perforated-plate
 diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
 x Wall thickness : 2
 x Length mm : 840

Start of delivery
 Prestroke mm : 0,3
 (from BDC) : +0,02(0,04)

Start of delivery block
 Piston stroke mm: 1,85
 mm: +0,02(0,06)
 Outlet : 0

Injection-pump setting values
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900

Setting value mm: 2,4...2,8

Supply-pump pressure:

Speed 1/min: 900
 Setting value bar: 3,8...4,4

Full-load del. w/out charge press.:

Speed 1/min : 750
 Del.quantity cm³/
 1000H.: 92,0...93,0
 Dispersion cm³/ : 4,0
 1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 480
 Del.quantity cm³/
 1000H.: 11,0...17,0

Full-load speed regulation:

Speed 1/min: 1190
 Del.quantity cm³/
 1000H: 15,0...25,0

Start:

Speed 1/min: 100
 Del.quantity : -
 mind cm³/1000H.: 70,0

Inspection-pump test specifications
 Test specifications in parentheses

Timing-device characteristic:

1st speed	1/min: 750
TD travel	mm: 1,3...2,1
	mm: (1,0...2,4)
2nd speed	1/min: 900
TD travel	mm: 2,4...2,8
	mm: (1,9...3,3)
3rd speed	1/min: 1100
TD travel	mm: 3,0...3,8
	mm: (2,7...4,1)

Supply-pump pressure characteristic:

1st speed	1/min: 500
Supply-pump pressure	bar: 2,2...2,8
2nd speed	1/min: 750
Supply-pump pressure	bar: 3,2...3,8
3rd speed	1/min: 900
Supply-pump pressure	bar: 3,8...4,4

4th speed 1/min: 1100

Supply-pump pressure bar: 4,6...5,2

Overflow quantity at overflow valve:

1st speed 1/min: 500

Overflow quantity cm³/10s: 41...83
10s: (26...98)

2nd speed 1/min: 1100

Overflow quantity cm³/10s: 55...138
10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1250

Del.quantity cm³/: 0,0...3,0
1000H.: -

2nd speed 1/min: 1230

Del.quantity cm³/: 0,0...15,0
1000H.: -

3rd speed 1/min: 1190

Del.quantity cm³/: 15,0...25,0
1000H.: -

4th speed 1/min: 1100

Del.quantity cm³/: 75,0...78,0
1000H.: (73,5...79,5)

5th speed 1/min: 900

Del.quantity cm³/: 80,5...83,5
1000H.: (78,5...85,5)

6th speed 1/min: 750

Del.quantity cm³/: 92,0...93,0
1000H.: (89,5...95,5)

7th speed 1/min: 500

Del.quantity cm³/: 91,0...101,0
1000H.: (90,0...102,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100

Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 480

ELAB volt: -

Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 480

Del.quantity cm³/: 11,0..17,0
1000H.: (9,0...19,0)

2nd speed 1/min: 550

Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130

Del.quantity cm³/: -
ind. 1000H: 70,0

Shutoff electromagnet:

Cut-in
min. voltage : 20,0
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,1...5,5
MS	mm	:	0,8...1,2
SVS max.	mm	:	2,2
XK	mm	:	18,8...20,8
XL	mm	:	11,9...15,3

Remarks:

:
Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W72
Edition : 31.10.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R320-2
Type number : 0 460 426 139
Customer Part-No. : 3 916 896

Customer-specific information
Customer : CDC

Engine : 6 BT -5,9

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0,5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery block
Piston stroke mm: 1,4
mm: +0,02(0,06)
Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Charge press. hPa: 1200
Setting value mm: 1,3...1,7
KSB solenoid-operated
valve volt: 12,0

Supply-pump pressure:

Speed 1/min: 1100
Charge press. hPa: 1200
Setting value bar: 6,8...7,4
KSB solenoid-operated
valve volt: 12,0

Full-load del. with charge press.:

Speed 1/min: 1100
Charge press. hPa: 1200
Del.quantity cm³/
1000H.: 73,0...74,0
KSB solenoid-operated
valve volt: 12,0
Dispersion cm³/ : 4,0
1000H. : (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm³/
1000H.: 51,0...52,0
KSB solenoid-operated
valve volt: 12,0
Dispersion cm³/ : 9,0
1000H. : (9,0)

Low-idle speed regulation:

Speed 1/min: 350
Charge press. hPa: -
Del.quantity cm³/
1000H.: 5,5...9,5
KSB solenoid-operated
valve volt: 12,0
Dispersion cm³/ : 5,5
1000H. : (7,0)

Full-load speed regulation:

Speed 1/min: 1340
Charge press. hPa: 1200
Del.quantity cm³/
1000H.: 52,5...58,5
KSB solenoid-operated
valve volt: 12,0

Start:

Speed 1/min: 100
Charge press. hPa: -
Del.quantity : -
mind cm³/1000H.: 70,0
KSB solenoid-operated
valve volt: 12,0

Inspection-pump test specifications

Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 450*
Charge press. hPa: -
TD travel mm: 3,0...4,0 *
mm: -
KSB solenoid-operated
valve volt: -
2nd speed 1/min: 1000
Charge press. hPa: 1200
TD travel mm: 0,5...1,3
mm: (0,2...1,6)
KSB solenoid-operated
valve volt: 12,0
3rd speed 1/min: 1100
Charge press. hPa: 1200
TD travel mm: 1,3...1,7
mm: (0,8...2,2)
KSB solenoid-operated
valve volt: 12,0
4th speed 1/min: 1250
Charge press. hPa: 1200
TD travel mm: 2,2...3,0
mm: (1,9...3,3)
KSB solenoid-operated
valve volt: 12,0

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1200
Supply-pump
pressure bar: 4,1...4,7
KSB solenoid-operated
valve volt: 12,0
2nd speed 1/min: 1100
Charge press. hPa: 1200
Supply-pump
pressure bar: 6,8...7,4
KSB solenoid-operated
valve volt: 12,0
3rd speed 1/min: 1250
Charge press. hPa: 1200
Supply-pump
pressure bar: 7,5...8,1
KSB solenoid-operated
valve volt: 12,0

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
KSB solenoid-operated
valve volt: 12,0
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1250

Charge press. hPa: 1200
KSB solenoid-operated
valve volt: 12,0
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting
point hPa: 700
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³: 68,0...69,0
1000H.: (64,5...72,5)
2nd speed 1/min: 1550
Charge press. hPa: 1200
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³: 0,0...3,0
1000H.: -
3rd speed 1/min: 1400
Charge press. hPa: 1200
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³: 15,0...55,0
1000H.: -
4th speed 1/min: 1340
Charge press. hPa: 1200
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³: 52,5...58,5
1000H.: (49,5...61,5)
5th speed 1/min: 1250
Charge press. hPa: 1200
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³: 70,5...73,5
1000H.: (69,0...75,0)
6th speed 1/min: 1100
Charge press. hPa: 1200
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³: 73,0...74,0
1000H.: (70,5...76,5)
7th speed 1/min: 750
Charge press. hPa: 1200
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³: 72,0...77,0
1000H.: (70,0...79,0)
8th speed 1/min: 700
Charge press. hPa: 700
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³: 68,0...69,0
1000H.: (64,5...72,5)
9th speed 1/min: 500
Charge press. hPa: -

KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 51,0...52,0
 1000H: (47,5...55,5)

KF mm : K-OT
MS mm : 0,8...1,2
SVS max. mm : 1,4

Zero delivery (stop):

Remarks:

Mech. shutoff:

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

Speed 1/min: 1250
Del.quantity cm³/: 0..3
 1000H.: -

* Correction at adjusting nut (46)

Electr. shutoff:

Operate control lever after each
manifold-pressure compensator pressure
change.

Speed 1/min: 350
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

* Unscrew KSB ball valve 2 mm

Idle delivery:

1st speed 1/min: 350
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 5,5...9,5
 1000H.: (2,5...12,5)

2nd speed 1/min: 450
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 0,0...4,0
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Charge press. hPa: -
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: -
ind. 1000H: 70,0

2nd speed 1/min: 250
Charge press. hPa: -
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: -
max. 1000H: 50,0
Del.quantity cm³/: -

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : 3,7

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W71
Edition : 31.10.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R320-2
Type number : 0 460 426 139
Customer Part-No. : 3 916 897

Customer-specific information
Customer : CDC

Engine : 6 BT -5,9

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0,5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery block
Piston stroke mm: 1,4
mm: +0,02(0,06)
Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Charge press. hPa: 1200
Setting value mm: 1,3...1,7
KSB solenoid-operated
valve volt: 24,0

Supply-pump pressure:

Speed 1/min: 1100
Charge press. hPa: 1200
Setting value bar: 6,8...7,4
KSB solenoid-operated
valve volt: 24,0

Full-load del. with charge press.:

Speed 1/min: 1100
Charge press. hPa: 1200
Del.quantity cm³/
1000H.: 73,0...74,0
KSB solenoid-operated
valve volt : 24,0
Dispersion cm³/ : 4,0
1000H : (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm³/
1000H.: 51,0...52,0
KSB solenoid-operated
valve volt: 24,0
Dispersion cm³/ : 9,0
1000H.: (9,0)

Low-idle speed regulation:

Speed 1/min: 350
Charge press. hPa: -
Del.quantity cm³/
1000H.: 5,5...9,5
KSB solenoid-operated
valve volt: 24,0
Dispersion cm³/ : 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1340
Charge press. hPa: 1200
Del.quantity cm³/
1000H: 52,5...58,5
KSB solenoid-operated
valve volt: 24,0

Start:

Speed 1/min: 100
Charge press. hPa: -
Del.quantity : -
mind cm³/1000H.: 70,0
KSB solenoid-operated
valve volt: 24,0

Inspection-pump test specifications

Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 450*

Charge press. hPa: -

TD travel mm: 3,0...4,0 *

mm: -

KSB solenoid-operated

valve volt: -

2nd speed 1/min: 1000

Charge press. hPa: 1200

TD travel mm: 0,5...1,3

mm: (0,2...1,6)

KSB solenoid-operated

valve volt: 24,0

3rd speed 1/min: 1100

Charge press. hPa: 1200

TD travel mm: 1,3...1,7

mm: (0,8...2,2)

KSB solenoid-operated

valve volt: 24,0

4th speed 1/min: 1250

Charge press. hPa: 1200

TD travel mm: 2,2...3,0

mm: (1,9...3,3)

KSB solenoid-operated

valve volt: 24,0

Supply-pump pressure characteristic:

1st speed 1/min: 500

Charge press. hPa: 1200

Supply-pump

pressure bar: 4,1...4,7

KSB solenoid-operated

valve volt: 24,0

2nd speed 1/min: 1100

Charge press. hPa: 1200

Supply-pump

pressure bar: 6,8...7,4

KSB solenoid-operated

valve volt: 24,0

3rd speed 1/min: 1250

Charge press. hPa: 1200

Supply-pump

pressure bar: 7,5...8,1

KSB solenoid-operated

valve volt: 24,0

Overflow quantity at overflow valve:

1st speed 1/min: 500

Charge press. hPa: -

KSB solenoid-operated

valve volt: 24,0

Overflow : 41...83

quantity cm³/10s: (26...98)

2nd speed 1/min: 1250

Charge press. hPa: 1200
KSB solenoid-operated
valve volt: 24,0
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting
point hPa: 700
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: 68,0...69,0
1000H.: (64,5...72,5)

2nd speed 1/min: 1550
Charge press. hPa: 1200
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: 0,0...3,0
1000H.: -

3rd speed 1/min: 1400
Charge press. hPa: 1200
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: 15,0...55,0
1000H.: -

4th speed 1/min: 1340
Charge press. hPa: 1200
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: 52,5...58,5
1000H.: (49,5...61,5)

5th speed 1/min: 1250
Charge press. hPa: 1200
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: 70,5...73,5
1000H.: (69,0...75,0)

6th speed 1/min: 1100
Charge press. hPa: 1200
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: 73,0...74,0
1000H.: (70,5...76,5)

7th speed 1/min: 750
Charge press. hPa: 1200
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: 72,0...77,0
1000H.: (70,0...79,0)

8th speed 1/min: 700
Charge press. hPa: 700
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: 68,0...69,0
1000H.: (64,5...72,5)

9th speed 1/min: 500
Charge press. hPa: -

KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: 51,0...52,0
 1000H: (47,5...55,5)

KF mm : K-OT
MS mm : 0,8...1,2
SVS max. mm : 1,4

Zero delivery (stop):

Remarks:

Mech. shutoff:

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

Speed 1/min: 1250
Del.quantity cm³/: 0,3
 1000H.: -

* Correction at adjusting nut (46)

Electr. shutoff:

Operate control lever after each
manifold-pressure compensator pressure
change.

Speed 1/min: 350
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

* Unscrew KSB ball valve 2 mm

Idle delivery:

1st speed 1/min: 350
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: 5,5...9,5
 1000H.: (2,5...12,5)
2nd speed 1/min: 450
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: 0,0...4,0
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Charge press. hPa: -
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: -
ind. 1000H: 70,0

2nd speed 1/min: 250
Charge press. hPa: -
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: -
max. 1000H: 50,0
Del.quantity cm³/: -

Shutoff electromagnet:

Cut-in
min. voltage : 20,0
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation
K mm : 3,7

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W73
 Edition : 31.10.90
 replaces : -
 Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R320-2
 Type number : 0 460 426 139
 Customer Part-No. : 3 916 992

Customer-specific information
 Customer : CDC

Engine : 6 BT -5,9

TEST BENCH REQUIREMENTS

Calibrating-oil
 return temp. °C

with thermometer : 40...48
 electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
 assembly : 1 688 901 027

Opening
 pressure bar : 250...253

Perforated-plate
 diameter mm : 0,5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
 x Wall thickness : 2
 x Length mm : 840

Start of delivery block
 Piston stroke mm: 1,4
 mm: +0,02(0,06)
 Outlet : D

Injection-pump setting values
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
 Charge press. hPa: 1200
 Setting value mm: 1,3...1,7
 KSB solenoid-operated
 valve volt: 24,0

Supply-pump pressure:

Speed 1/min: 1100
 Charge press. hPa: 1200
 Setting value bar: 6,8...7,4
 KSB solenoid-operated
 valve volt: 24,0

Full-load del. with charge press.:

Speed 1/min: 1100
 Charge press. hPa: 1200
 Del.quantity cm³/
 1000H.: 73,0...74,0
 KSB solenoid-operated
 valve volt : 24,0
 Dispersion cm³/ : 4,0
 1000H : (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500
 Del.quantity cm³/
 1000H.: 51,0...52,0
 KSB solenoid-operated
 valve volt: 24,0
 Dispersion cm³/ : 9,0
 1000H.: (9,0)

Low-idle speed regulation:

Speed 1/min: 350
 Charge press. hPa: -
 Del.quantity cm³/
 1000H.: 5,5...9,5
 KSB solenoid-operated
 valve volt: 24,0
 Dispersion cm³/ : 5,5
 1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1340
 Charge press. hPa: 1200
 Del.quantity cm³/
 1000H: 52,5...58,5
 KSB solenoid-operated
 valve volt: 24,0

Start:

Speed 1/min: 100
 Charge press. hPa: -
 Del.quantity : -
 mind cm³/1000H.: 70,0
 KSB solenoid-operated
 valve volt: 24,0

Inspection-pump test specifications

Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 450*

Charge press. hPa: -

TD travel mm: 3,0...4,0 *

mm: -

KSB solenoid-operated valve volt: -

2nd speed 1/min: 1000

Charge press. hPa: 1200

TD travel mm: 0,5...1,3
mm: (0,2...1,6)

KSB solenoid-operated valve volt: 24,0

3rd speed 1/min: 1100

Charge press. hPa: 1200

TD travel mm: 1,3...1,7
mm: (0,8...2,2)

KSB solenoid-operated valve volt: 24,0

4th speed 1/min: 1250

Charge press. hPa: 1200

TD travel mm: 2,2...3,0
mm: (1,9...3,3)

KSB solenoid-operated valve volt: 24,0

Supply-pump pressure characteristic:

1st speed 1/min: 500

Charge press. hPa: 1200

Supply-pump pressure bar: 4,1...4,7

KSB solenoid-operated valve volt: 24,0

2nd speed 1/min: 1100

Charge press. hPa: 1200

Supply-pump pressure bar: 6,8...7,4

KSB solenoid-operated valve volt: 24,0

3rd speed 1/min: 1250

Charge press. hPa: 1200

Supply-pump pressure bar: 7,5...8,1

KSB solenoid-operated valve volt: 24,0

Overflow quantity at overflow valve:

1st speed 1/min: 500

Charge press. hPa: -

KSB solenoid-operated valve volt: 24,0

Overflow : 41...83

quantity cm³/10s: (26...98)

2nd speed 1/min: 1250

Charge press. hPa: 1200
KSB solenoid-operated valve volt: 24,0
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700

Charge-air pressure-setting point hPa: 700

KSB solenoid-operated valve volt: 24,0
Del.quantity cm³: 68,0...69,0
1000H.: (64,5...72,5)

2nd speed 1/min: 1550

Charge press. hPa: 1200

KSB solenoid-operated valve volt: 24,0
Del.quantity cm³: 0,0...3,0
1000H.: -

3rd speed 1/min: 1400

Charge press. hPa: 1200

KSB solenoid-operated valve volt: 24,0
Del.quantity cm³: 15,0...55,0
1000H.: -

4th speed 1/min: 1340

Charge press. hPa: 1200

KSB solenoid-operated valve volt: 24,0
Del.quantity cm³: 52,5...58,5
1000H.: (49,5...61,5)

5th speed 1/min: 1250

Charge press. hPa: 1200

KSB solenoid-operated valve volt: 24,0
Del.quantity cm³: 70,5...73,5
1000H.: (69,0...75,0)

6th speed 1/min: 1100

Charge press. hPa: 1200

KSB solenoid-operated valve volt: 24,0
Del.quantity cm³: 73,0...74,0
1000H.: (70,5...76,5)

7th speed 1/min: 750

Charge press. hPa: 1200

KSB solenoid-operated valve volt: 24,0
Del.quantity cm³: 72,0...77,0
1000H.: (70,0...79,0)

8th speed 1/min: 700

Charge press. hPa: 700

KSB solenoid-operated valve volt: 24,0
Del.quantity cm³: 68,0...69,0
1000H.: (64,5...72,5)

9th speed 1/min: 500

Charge press. hPa: -

KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: 51,0...52,0
 1000H: (47,5...55,5)

KF mm : K-OT
MS mm : 0,8...1,2
SVS max. mm : 1,4

Zero delivery (stop):

Remarks:

Mech. shutoff:

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

Speed 1/min: 1250
Del.quantity cm³/: 0..3
 1000H.: -

* Correction at adjusting nut (46)

Electr. shutoff:

Operate control lever after each
manifold-pressure compensator pressure
change.

Speed 1/min: 350
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

* Unscrew KSB ball valve 2 mm

Idle delivery:

1st speed 1/min: 350
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: 5,5...9,5
 1000H.: (2,5...12,5)
2nd speed 1/min: 450
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: 0,0...4,0
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Charge press. hPa: -
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: -
ind. 1000H: 70,0

2nd speed 1/min: 250
Charge press. hPa: -
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: -
max. 1000H: 50,0
Del.quantity cm³/: -

Shutoff electromagnet:

Cut-in
min. voltage : 20,0
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation
K mm : 3,7

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 U38
 Edition : 31.10.90
 replaces : 12.07.89
 Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R225-23
 Type number : 0 460 426 143

Customer-specific information
 Customer : CDC

Engine : 6 BT -5,9 IN

TEST BENCH REQUIREMENTS

Calibrating-oil
 return temp. °C
 with thermometer : 40...48
 electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
 assembly : 1 688 901 027

Opening
 pressure bar : 250...253

Perforated-plate
 diameter mm : 0,5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
 x Wall thickness : 2
 x Length mm : 840

Start of delivery
 Prestroke mm : 0,3
 (from BDC) : +0,02(0,04)

Start of delivery block
 Piston stroke mm: 1,3
 mm: +0,02(0,06)

Outlet : D

Injection-pump setting values
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
 Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750
 Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

Speed 1/min : 900
 Del.quantity cm³/
 1000H.: 71,5...72,5
 Dispersion cm³/ : 4,0
 1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375
 Del.quantity cm³/
 1000H.: 8,0...14,00
 Dispersion cm³/ : 5,5
 1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1190
 Del.quantity cm³/
 1000H: 50,0...56,0

Start:

Speed 1/min: 100
 Del.quantity : -
 mind cm³/1000H.: 60,0

Inspection-pump test specifications
 Test specifications in parentheses

Timing-device characteristic:

1st speed	1/min: 500
TD travel	mm: 1,5...2,3
	mm: (1,2...2,6)
2nd speed	1/min: 750
TD travel	mm: 3,4...3,8
	mm: (2,9...4,3)
3rd speed	1/min: 1100
TD travel	mm: 5,5...6,3
	mm: (5,2...6,5)

Supply-pump pressure characteristic:

1st speed	1/min: 500
Supply-pump pressure	bar: 2,4...3,0
2nd speed	1/min: 750
Supply-pump pressure	bar: 3,5...4,1
3rd speed	1/min: 1100

Supply-pump
pressure bar: 4,8...5,4

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1150
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1300
Del.quantity cm³/: 0,0...3,0
1000H.: -
2nd speed 1/min: 1220
Del.quantity cm³/: 15,0...55,0
1000H.: -
3rd speed 1/min: 1190
Del.quantity cm³/: 50,0...56,0
1000H.: (47,0...59,0)
4th speed 1/min: 1150
Del.quantity cm³/: 66,5...69,5
1000H.: (65,0...71,0)
5th speed 1/min: 900
Del.quantity cm³/: 71,5...72,5
1000H.: (69,0...75,0)
6th speed 1/min: 500
Del.quantity cm³/: 55,5...64,5
1000H.: =

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 8,0...14,0
1000H.: (6,0...16,0)
2nd speed 1/min: 450
Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130

Del.quantity cm³/: -
ind. 1000H: 70,0

2nd speed 1/min: 240
Del.quantity cm³/: -
max. 1000H : 60,0

3rd speed 1/min: 240
Del.quantity cm³/: -
1000H: 60,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation	mm	:	-
K	mm	:	5,0...5,4
KF	mm	:	0,8...1,2
MS	mm	:	-
SVS max.	mm	:	-
XK	mm	:	20,2...22,2
XL	mm	:	11,5...14,9

Remarks:

: C.D.C. # 391 6949
Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 U49
 Edition : 31.10.90
 replaces : -
 Calibrating oil : ISO 4113

Injection pump : VE 6/12F1150 R225-23
 Type number : 0 460 426 143
 Customer Part-No. : 3 916 950

Customer-specific information
 Customer : CDC

Engine : 6 BT -5,9 IN

TEST BENCH REQUIREMENTS

Calibrating-oil
 return temp. °C
 with thermometer : 40...48
 electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
 assembly : 1 688 901 027

Opening
 pressure bar : 250...253

Perforated-plate
 diameter mm : 0,5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
 x Wall thickness : 2
 x Length mm : 840

Start of delivery
 Prestroke mm : 0,3
 (from BDC) : +0,02(0,04)

Start of delivery block
 Piston stroke mm : 1,3
 mm : +0,02(0,06)
 Outlet : 0

Injection-pump setting values
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750

Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750
 Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

Speed 1/min : 900
 Del.quantity cm³/
 1000H.: 71,5...72,5
 Dispersion cm³/: 4,0
 1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375
 Del.quantity cm³/
 1000H.: 8,0...14,00
 Dispersion cm³/: 5,5
 1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1190
 Del.quantity cm³/
 1000H: 50,0...56,0

Start:

Speed 1/min: 100
 Del.quantity : -
 mind cm³/1000H.: 60,0

Inspection-pump test specifications
 Test specifications in parentheses

Timing-device characteristic:

1st speed	1/min: 500
TD travel	mm: 1,5...2,3
	mm: (1,2...2,6)
2nd speed	1/min: 750
TD travel	mm: 3,4...3,8
	mm: (2,9...4,3)
3rd speed	1/min: 1100
TD travel	mm: 5,5...6,3
	mm: (5,2...6,5)

Supply-pump pressure characteristic:

1st speed	1/min: 500
Supply-pump	pressure bar: 2,4...3,0
2nd speed	1/min: 750
Supply-pump	pressure bar: 3,5...4,1
3rd speed	1/min: 1100

Supply-pump
pressure bar: 4,8...5,4

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow quantity cm³/10s: 41...83
2nd speed 1/min: 1150
Overflow quantity cm³/10s: 55...138
(26...98)
(40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1300
Del.quantity cm³/: 0,0...3,0
1000H.: -
2nd speed 1/min: 1220
Del.quantity cm³/: 15,0...55,0
1000H.: -
3rd speed 1/min: 1190
Del.quantity cm³/: 50,0...56,0
1000H.: (47,0...59,0)
4th speed 1/min: 1150
Del.quantity cm³/: 66,5...69,5
1000H.: (65,0...71,0)
5th speed 1/min: 900
Del.quantity cm³/: 71,5...72,5
1000H.: (69,0...75,0)
6th speed 1/min: 500
Del.quantity cm³/: 55,5...64,5
1000H.: -

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 8,0...14,0
1000H.: (6,0...16,0)
2nd speed 1/min: 450
Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130

Del.quantity cm³/: -
ind. 1000H: 70,0

2nd speed 1/min: 240
Del.quantity cm³/: -
max. 1000H : 60,0

3rd speed 1/min: 240
Del.quantity cm³/: -
1000H: 60,0

Shutoff electromagnet:

Cut-in
min. voltage : 20,0
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation	
K	mm : -
KF	mm : 5,0...5,4
MS	mm : 0,8...1,2
SVS max.	mm : -
XK	mm : 20,2...22,2
XL	mm : 11,5...14,9

Remarks:

:
Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RAB 9,7 b 1
 Edition : 28.11.90
 Replaces : 11.11.88
 Test oil : ISO-4113

 Combination no. : 0 400 846 543

 Injection pump
 Pump designation : PES6A95D420LS2595
 EP type number : 0 410 896 930
 Governor
 Governor design. : RQ200/1100AB1210R
 Governor no. : 0 420 201 643

 Customer-spec. information
 Customer : RABA

 Engine : D2156MT6U

 1st version kW : 188.0
 Rated speed : 2200

 TEST BENCH REQUIREMENTS

 Test oil
 inlet temp. °C : 38...42

 Overflow valve : 1 417 413 000

 Inlet press., bar : 1.50

 Test nozzle holder
 assembly : 0 681 343 009

 Opening
 pressure, bar : 172...175

 Test lines : 1 680 750 014

 Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

 (A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

 BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

 Prestroke mm : 2.00...2.10
 : (1.95...2.05)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.60...12.70

Del.quantity cm³/ : 12.6...12.8

100 s: (12.4...13.0)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 200.0

Rack travel in mm : 7.3...7.5

Del.quantity cm³/ : 0.9...1.5

100 s: (0.6...1.7)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 700

Del.quantity : 126.5...128.5

1000 : (124.5...130.5)

Spread cm³ : 3.00

1000 : (6.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 19.9

Testing:

1st rack travel in: 11.60

Speed rpm : 1145...1160

2nd rack travel in: 4.00

Speed rpm : 1190...1220

LOW IDLE 1
Setting point w/out bumper spring
Speed rpm : 200
Rack travel in mm : 6.4

Testing:
Speed rpm : 100
Minimum rack trave: 7.60
Speed rpm : 200
Rack travel in mm : 6.30...6.50
Rack travel in mm : 2.00
Speed rpm : 320...360
Speed rpm : 450
Maximum rack trave: 1.00

TORQUE CONTROL
Dimension a mm : 1.20
Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 12.60...12.70
2nd speed rpm : 600
Rack travel in m: 13.80...14.00
3rd speed rpm : 865
Rack travel in m: 13.40...13.70
4th speed rpm : 985
Rack travel in m: 13.00...13.20

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 700
Rack travel mm : 13.80...13.90

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 11.10...11.20
2nd pressure hPa : 340
Rack travel in m: 12.80...12.90
3rd pressure hPa : 250
Rack travel in m: 11.20...11.40

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 700
Speed rpm : 700
Del.quantity cm3/ : 135.0...138.0
1000 s: (133.0...140.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 82.5...84.5
1000 s: (80.5...86.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.60
Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 177.0...187.0
1000 s: (174.0...190.0)

Remarks:
:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

Set idle stop at 200 min ⁻¹ to a control-rod travel of 6.4 mm

APPLICATION

Omnibus

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : VOL 12,2 i
 Edition : 16.11.90
 Replaces : 29.6.90
 Test oil : ISO-4113

Combination no. : 0 401 846 923

Injection pump
 Pump designation : PE6P120A320RS3118
 EP type number : 0 411 826 726
 Governor
 Governor design. : RQV250...1100PA920-6
 Governor no. : 0 421 813 872

Customer-spec. information
 Customer : VOLVO-TRUCK

Engine : THD 102 KD

1st version kW : 250.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 2.60...2.70
 : (2.55...2.75)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.30...13.40

Del.quantity cm³/ : 22.2...22.4

100 s: (21.9...22.7)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 250.0
 Rack travel in mm : 5.1...5.3
 Del.quantity cm³/ : 2.9...3.5
 100 s: (2.6...3.8)
 Spread cm³ : 0.5
 100 s: (0.7)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250
 travel mm : 1.00...1.40
 2nd speed rpm : 500
 travel mm : 4.10...4.70
 3rd speed rpm : 800
 travel mm : 6.30...6.70
 4th speed rpm : 1140
 travel mm : 7.70...7.90
 5th speed rpm : 1230
 travel mm : 9.00...9.40

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1175
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 700
 Aneroid pressure h: 1200

Del.quantity : 222.0...224.0
1000 : (219.0...227.0)
Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 113...121

Testing:

1st rack travel in: 12.30
Speed rpm : 1130...1140
2nd rack travel in: 4.00
Speed rpm : 1200...1230
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 60...68

Testing:

Speed rpm : 100
Minimum rack trave: 6.60
Speed rpm : 250
Rack travel in mm : 5.10...5.30

CONSTANT REGULATION

Speed rpm : 250...400

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 1200
Rack travel mm : 13.30...13.40

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.00...9.20
2nd pressure hPa : 150
Rack travel in m: 9.40...9.50
3rd pressure hPa : 770
Rack travel in m: 12.90...13.10

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: -
Speed rpm : 700
Del.quantity cm³/ : 133.0...135.0
1000 s: (130.0...138.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 12.30
Speed rpm : 1130...1140

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 230.0...270.0
1000 s: (225.0...275.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 250
Rack travel in mm : 5.10...5.30
Del.quantity cm³/ : 29.0...35.0
1000 s: (26.0...38.0)
Spread cm³ : 5.00
1000 s: (7.00)

Remarks:

:
Delivery-valve spring pre-tension =
2.40...2.60 mm.
Permissible alteration from 2.20...2.90
mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 11.9 q
 Edition : 06.07.90
 Replaces : 30.3.90
 Test oil : ISO-4113

Combination no. : 0 402 036 734

Injection pump
 Pump designation : PES6P120A720/3LS3247
 EP type number : 0 412 026 735
 Governor
 Governor design. : RQ300/1100PA813-12
 Governor no. : 0 421 801 518

Customer-spec. information

Customer : MAN

Engine : D2866LXF/A00

1st version kW : 273.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
 : (3.65...3.85)
 Rack travel in mm : 14.50...15.50
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 5.90...6.10
 & maximum rack tra: 14.5...15.5
 Difference ° CS : 2.00...4.00

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 15.00...15.10

Del.quantity cm³/ : 24.2...24.4

100 s: (23.9...24.7)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 300.0
 Rack travel in mm : 4.8...5.2
 Del.quantity cm³/ : 1.7...2.3
 100 s: (1.4...2.6)
 Spread cm³ : 0.8
 100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 1200

Del.quantity : 242.0...244.0

1000 : (239.0...247.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600
Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.70
Speed rpm : 1145...1160
2nd rack travel in: 4.00
Speed rpm : 1200...1230
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.0

Testing:

Speed rpm : 200
Minimum rack trave: 6.50
Speed rpm : 300
Rack travel in mm : 4.90...5.10
Rack travel in mm : 2.00
Speed rpm : 365...405

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 14.70...14.80
2nd speed rpm : 700
Rack travel in m: 15.00...15.10
3rd speed rpm : 900
Rack travel in m: 14.80...15.00

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 1200
Rack travel mm : 15.00...15.10

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 11.70...11.90
2nd pressure hPa : 110
Rack travel in m: 12.00...12.10
3rd pressure hPa : 470
Rack travel in m: 14.00...14.40

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 1100
Del.quantity cm3/ : 230.0...236.0
1000 s: (227.0...239.0)

Aneroid pressure h: -
Speed rpm : 700
Del.quantity cm3/ : 95.0...101.0
1000 s: (92.0...104.0)

Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 134.0...136.0
1000 s: (131.0...139.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 13.70
Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 210.0...230.0
1000 s: (206.0...234.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 4.80...5.20
Del.quantity cm3/ : 17.0...23.0
1000 s: (14.0...26.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

: MAN-NR. 2-7889

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 11,9 r1
 Edition : 05.11.90
 Replaces : -
 Test oil : ISO-4113

Combination no. : 0 402 036 735X

Injection pump
 Pump designation : PES6P120A720/3LS3250
 -1

EP type number : 0 412 026 742

Governor

Governor design. : RQ300/1000PA813-13

Governer no. : 0 421 801 529

Cust. part no. : 3-7050X

Customer-spec. information

Customer : MAN

Engine : D2866LX

1st version kW : 265.0

Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.70...3.80

: (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.30...13.40

Del.quantity cm³/ : 24.2...24.4

100 s: (23.9...24.7)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.1...4.3

Del.quantity cm³/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm³ : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 650

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 1200

Del.quantity : 242.0...244.0

1000 : (239.0...247.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 650

Rack travel in mm : 20.0

Testing:
1st rack travel in: 12.00
Speed rpm : 1045...1060
2nd rack travel in: 4.00
Speed rpm : 1090...1120
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 4.2

Testing:
Speed rpm : 100
Minimum rack trave: 5.70
Speed rpm : 300
Rack travel in mm : 4.10...4.30
Rack travel in mm : 2.00
Speed rpm : 330...370

TORQUE CONTROL
Dimension a mm : 0.20
Torque control curve - 1st version
1st speed rpm : 1000
Rack travel in m: 13.00...13.10
2nd speed rpm : 700
Rack travel in m: 13.50...13.70

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 1200
Rack travel mm : 13.30...13.40

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.80...10.00
2nd pressure hPa : 110
Rack travel in m: 10.20...10.30
3rd pressure hPa : 470
Rack travel in m: 11.90...12.30

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 1000

Del.quantity cm³/ : 236.0...242.0
1000 s: (233.0...245.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 134.0...136.0
1000 s: (131.0...139.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 12.00
Speed rpm : 1045...1060

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 210.0...230.0
1000 s: (206.0...234.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 4.10...4.30
Del.quantity cm³/ : 17.0...23.0
1000 s: (14.0...26.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 11.9 u4
 Edition : 30.11.90
 Replaces : 31.7.90
 Test oil : ISO-4113

Combination no. : 0 402 036 742

Injection pump
 Pump designation : PES6P120A720/3LS3255
 EP type number : 0 412 026 739
 Governor
 Governor design. : RQ300/1100PA813-7
 Governor no. : 0 421 801 474

Customer-spec. information
 Customer : MAN

Engine : D2866LF01

1st version kW : 273.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
 : (3.65...3.85)
 Rack travel in mm : 14.50...15.50
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 5.90...6.10
 & maximum rack tra: 14.5...15.5
 Difference ° CS : 2.00...4.00

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 15.00...15.10

Del.quantity cm³/ : 24.2...24.4

100 s: (23.9...24.7)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 300.0
 Rack travel in mm : 5.0...5.4
 Del.quantity cm³/ : 1.7...2.3
 100 s: (1.4...2.6)
 Spread cm³ : 0.8
 100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 650

Rack travel in mm : 16.00...17.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 1200

Del.quantity : 242.0...244.0

1000 : (239.0...247.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 650
Rack travel in mm : 16.8

Testing:

1st rack travel in: 13.80
Speed rpm : 1145...1160
2nd rack travel in: 4.00
Speed rpm : 1200...1230
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.2

Testing:

Speed rpm : 200
Minimum rack trave: 6.50
Speed rpm : 300
Rack travel in mm : 5.10...5.30
Rack travel in mm : 2.00
Speed rpm : 400...440

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 14.80...14.90
2nd speed rpm : 700
Rack travel in m: 15.80...16.00
3rd speed rpm : 900
Rack travel in m: 15.10...15.30

**Aneroid/Altitude
Compensator Test**

1st version

Setting
Speed rpm : 500
Pressure hPa : 1200
Rack travel mm : 15.00...15.10

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 11.70...11.90
2nd pressure hPa : 110
Rack travel in m: 12.00...12.10
3rd pressure hPa : 470
Rack travel in m: 14.00...14.40

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 1100
Del.quantity cm³/ : 230.0...236.0
1000 s: (227.0...239.0)
Speed rpm : 700
Del.quantity cm³/ : 90.0...100.0
1000 s: (87.0...103.0)
Spread cm³ : 10.00
1000 s: (-)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 134.0...136.0
1000 s: (131.0...139.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 13.80
Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 210.0...230.0
1000 s: (206.0...234.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 5.00...5.40
Del.quantity cm³/ : 17.0...23.0
1000 s: (14.0...26.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks: : MAN-NR. 2-7946

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 6
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI 9,8 k
 Edition : 30.11.90
 Replaces : 20.7.90
 Test oil : ISO-4113

Combination no. : 0 402 046 340

Injection pump
 Pump designation : PES6P120A320RS525
 EP type number : 0 412 026 058
 Governor
 Governor design. : RQV300...1050PA955
 Governor no. : 0 421 813 856

Customer-spec. information

Customer : RVI

Engine : MIDS062045J

1st version kW : 160.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...2.95)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 9.40...9.50

Del.quantity cm³/ : 13.8...14.0

100 s: (13.5...14.3)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.3...5.7

Del.quantity cm³/ : 1.5...2.1

100 s: (1.2...2.4)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1050

travel mm : 8.00...8.20

2nd speed rpm : 300

travel mm : 1.10...1.50

3rd speed rpm : 430

travel mm : 3.40...4.00

4th speed rpm : 1400

travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1075

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Del.quantity : 138.0...140.0

1000 : (135.0...143.0)

Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 298...306

Testing:

1st rack travel in: 8.40
Speed rpm : 1130...1140
2nd rack travel in: 4.20
Speed rpm : 1190...1220
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 244...252

Testing:

Speed rpm : 200
Minimum rack trave: 7.40
Speed rpm : 300
Rack travel in mm : 5.40...5.60

CONSTANT REGULATION

Speed rpm : 310...430

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700
Del.quantity cm³/ : 126.0...134.0
1000 s: (123.0...137.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 8.40
Speed rpm : 1130...1140

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 140.0...160.0
1000 s: (136.0...164.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 5.30...5.70
Del.quantity cm³/ : 15.0...21.0
1000 s: (12.0...24.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

:
Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI 6,2 b 1
 Edition : 15.08.89
 Replaces : 16.12.88
 Test oil : ISO-4113
 Combination no. : 0 402 046 788
 Injection pump
 Pump designation : PES6P110A320RS3190
 EP type number : 0 412 016 720
 Governor
 Governor design. : RQV275...1175PA833-3
 Governer no. : 0 421 813 656
 Customer-spec. information
 Customer : RVI
 Engine : MIDR 060226D
 1st version kW : 151.0
 Rated speed : 2350
TEST BENCH REQUIREMENTS
 Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 025
 Inlet press., bar : 1.50
 Test nozzle holder assembly : 0 681 343 009
 Opening pressure, bar : 172...175
 Test lines : 1 680 750 015
 Outside diameter x Wall thickness x Length mm : 6.00X1.50X600
(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____
BEGINNING OF DELIVERY
 Test pressure, bar: 25...27
 Prestroke mm : 4.20...4.30
 : (4.15...4.35)
 Rack travel in mm : 18.00...21.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1175

Rack travel in mm : 13.40...13.50

Del.quantity cm³ : 11.6...11.9

100 s: (11.3...12.1)

Spread cm³ : 0.4

100 s: (0.7)

2nd speed rpm : 275.0

Rack travel in mm : 4.6...5.0

Del.Quantity cm³ : 2.7...3.2

100 s: (2.4...3.4)

Spread cm³ : 0.1

100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 0.90...1.10

2nd speed rpm : 450

travel mm : 3.40...3.80

3rd speed rpm : 800

travel mm : 5.10...5.50

4th speed rpm : 1175

travel mm : 7.20...7.50

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1330

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1175

Aneroid pressure h: 1000

Del.quantity : 116.0...119.0

1000 : (113.5...121.5)

Spread cm³ : 4.00

1000 : (7.50)

RATED SPEED

1st version

Control lever
position degrees: 118...126

Testing:

1st rack travel in: 12.40
Speed rpm : 1245...1255
2nd rack travel in: 4.00
Speed rpm : 1400...1430
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 80...88

Testing:

Speed rpm : 200
Minimum rack trave: 7.10
Speed rpm : 275
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION

Speed rpm : 250...320

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 1000
Rack travel mm : 13.40...13.50

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.70...9.90
2nd pressure hPa : 400
Rack travel in m: 12.80...12.90
3rd pressure hPa : 160
Rack travel in m: 10.80...11.20

START CUT-OUT

Speed 1/min : 195 (215)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000
Speed rpm : 700
Del.quantity cm3/ : 111.5...116.5
1000 s: (108.5...119.5)
Aneroid pressure h: -

Speed rpm : 500
Del.quantity cm3/ : 47.5...50.5
1000 s: (45.0...53.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 12.40
Speed rpm : 1245...1255

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 90.0...110.0
1000 s: (86.0...114.0)

LOW IDLE

Speed rpm : 275
Rack travel in mm : 4.60...4.80
Del.quantity cm3/ : 27.0...32.0
1000 s: (24.5...34.5)
Spread cm3 : 4.50
1000 s: (7.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI 12.0 f2
 Edition : 22.11.90
 Replaces : 5.11.90
 Test oil : ISO-4113

Combination no. : 0 402 046 791

Injection pump
 Pump designation : PES6P120A320RS3139
 EP type number : 0 412 026 718
 Governor
 Governor design. : RQV275...950PA728-4
 Governer no. : 0 421 813 678

Customer-spec. information

Customer : RVI

Engine : MIDR 063540 H

1st version kW : 264.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60
 : (3.45...3.65)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.30...13.40

Del.quantity cm³/

100 s: (20.9...21.7)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 5.60...6.00

Del.quantity cm³/

100 s: (2.0...3.2)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed	rpm	: 275
travel mm		: 1.30...1.70
2nd speed	rpm	: 450
travel mm		: 3.30...3.70
3rd speed	rpm	: 800
travel mm		: 5.60...6.00
4th speed	rpm	: 950
travel mm		: 6.70...6.90
5th speed	rpm	: 1500
travel mm		: 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1125

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1000

Del.quantity : 212.0...214.0

1000 : (209.0...217.0)

Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 118...126

Testing:

1st rack travel in: 12.30
Speed rpm : 1015...1025
2nd rack travel in: 4.00
Speed rpm : 1160...1190
4th rack travel in: 1250
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 65...73

Testing:

Speed rpm : 200
Minimum rack trave: 7.60
Speed rpm : 275
Rack travel in mm : 5.70...5.90

CONSTANT REGULATION

Speed rpm : 295...400

Aneroid/Altitude Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 1000
Rack travel mm : 13.30...13.40

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.20...9.50
2nd pressure hPa : 660
Rack travel in m: 12.60...12.70
3rd pressure hPa : 200
Rack travel in m: 10.20...10.40

START CUT-OUT

Speed 1/min : 195 (215)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1000
Speed rpm : 950

Del.quantity cm³/ : 210.0...216.0
 1000 s: (207.0...219.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 117.0...119.0
 1000 s: (114.0...122.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 12.30
Speed rpm : 1015...1025

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 150.0...180.0
 1000 s: (146.0...184.0)

LOW IDLE

Speed rpm : 275
Rack travel in mm : 5.70...5.90
Del.quantity cm³/ : 23.0...29.0
 1000 s: (20.0...32.0)
Spread cm³ : 8.00
 1000 s: (12.00)

Remarks:

:
Start-of-delivery mark 9° cam angle
after start of delivery cyl. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI 6,2 f
 Edition : 30.11.90
 Replaces : 9.11.89
 Test oil : ISO-4113
 Combination no. : 0 402 046 811
 Injection pump
 Pump designation : PES6P110A320RS3233
 EP type number : 0 412 016 728
 Governor
 Governor design. : RQV275...1175PA833-4
 Governer no. : 0 421 813 762
 Customer-spec. information
 Customer : RVI
 Engine : MIDR 060226D
 1st version kW : 166.0
 Rated speed : 2350
TEST BENCH REQUIREMENTS
 Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 025
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 0 681 343 009
 Opening
 pressure, bar : 172...175
 Test lines : 1 680 750 015
 Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600
(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____
BEGINNING OF DELIVERY
 Test pressure, bar: 25...27
 Prestroke mm : 4.20...4.30
 : (4.15...4.35)
 Rack travel in mm : 18.00...21.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1175

Rack travel in mm : 13.50...13.60

Del.quantity cm³/ : 11.7...12.0

100 s: (11.4...12.2)

Spread cm³ : 0.4

100 s: (0.7)

2nd speed rpm : 275.0

Rack travel in mm : 4.80...5.00

Del.quantity cm³/ : 2.8...3.3

100 s: (2.5...3.5)

Spread cm³ : 0.4

100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 0.40...0.60

2nd speed rpm : 450

travel mm : 2.90...3.50

3rd speed rpm : 800

travel mm : 4.60...5.00

4th speed rpm : 1175

travel mm : 6.90...7.10

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1175

Aneroid pressure h: 1000

Del.quantity : 117.0...120.0

1000 : (114.5...122.5)

Spread cm³ : 4.00

1000 : (7.50)

RATED SPEED

1st version

Control lever
position degrees: 113...121

Testing:

1st rack travel in: 12.50
Speed rpm : 1255...1265
2nd rack travel in: 4.00
Speed rpm : 1410...1440
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 80...88

Testing:

Speed rpm : 200
Minimum rack trave: 7.20
Speed rpm : 275
Rack travel in mm : 4.80...5.00

CONSTANT REGULATION

Speed rpm : 250...320

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 1000
Rack travel mm : 13.50...13.60

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.00...9.60

2nd pressure hPa : 400
Rack travel in m: 12.50...12.60
3rd pressure hPa : 160
Rack travel in m: 10.50...10.90

START CUT-OUT

Speed 1/min : 195 (215)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000
Speed rpm : 700
Del.quantity cm3/ : 113.5...118.5
1000 s: (110.5...121.5)
Aneroid pressure h: -

Speed rpm : 500
Del.quantity cm3/ : 49.5...52.5
1000 s: (47.0...55.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 12.50
Speed rpm : 1255...1265

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 85.0...105.0
1000 s: (81.0...109.0)

LOW IDLE

Speed rpm : 275
Rack travel in mm : 4.80...5.00
Del.quantity cm3/ : 28.0...33.0
1000 s: (25.5...35.5)
Spread cm3 : 4.50
1000 s: (7.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 21.0 e1
 Edition : 05.11.90
 Replaces : 14.9.90
 Test oil : ISO-4113

Combination no. : 0 402 640 818

Injection pump
 Pump designation : PE12P120A520LS7829
 EP type number : 0 412 620 821
 Governor
 Governor design. : RQV300...1150PA943-1
 Governor no. : 0 421 813 869

Customer-spec. information

Customer : MAN
 Engine : D2842LZE

1st version kW : 809.0
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60
 : (4.45...4.65)
 Rack travel in mm : 9.00...12.00
 Firing order : 12- 1- 5- 9- 8- 3-
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-
 180-225-240-285-300-
 Phasing : 345
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 13.80...13.90

Del.quantity cm³/ : 30.4...30.6

100 s: (30.1...30.9)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 500.0
 Rack travel in mm : 9.00...9.20
 Del.quantity cm³/ : 14.9...15.1

100 s: (14.6...15.4)

Spread cm³ : 0.8

100 s: (1.2)

3rd speed rpm : 300

Rack travel in mm : 7.30...7.50

Del.quantity cm³/ : 5.2...6.0 *

100 s: (-)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed	rpm	: 300
	travel mm	: 1.20...1.60
2nd speed	rpm	: 450
	travel mm	: 2.90...3.50
3rd speed	rpm	: 750
	travel mm	: 5.70...6.10
4th speed	rpm	: 1150
	travel mm	: 9.50...9.70
5th speed	rpm	: 1400
	travel mm	: 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1225

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150
Aneroid pressure h: 1300
Del.quantity : 304.0...306.0
1000 : (301.0...309.0)
Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version

Control lever
position degrees: 116...124

Testing:

1st rack travel in: 12.80
Speed rpm : 1190...1200
2nd rack travel in: 4.00
Speed rpm : 1300...1330
4th rack travel in: 1400
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 76...84

Testing:

Speed rpm : 100
Minimum rack trave: 8.90
Speed rpm : 300
Rack travel in mm : 7.30...7.50

CONSTANT REGULATION

Speed rpm : 280...410

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 1300
Rack travel mm : 13.80...13.90

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.00...9.20
2nd pressure hPa : 100
Rack travel in m: 9.50...9.60
3rd pressure hPa : 470
Rack travel in m: 12.40...12.80

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 149.0...151.0
1000 s: (146.0...154.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 12.80
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 100.0...120.0 *
1000 s: (-)

Speed rpm : 100
Del.quantity cm³/ : - **
1000 s: (-)
Rack travel in mm : 17.50

HIGH IDLE

1st version

Speed rpm : 500
Rack travel in mm : < 7.00
Del.quantity cm³/ : - **
1000 s: (-)

2nd version

Speed rpm : 500
Rack travel in mm : < 7.50
Del.quantity cm³/ : < 50.0
1000 s: (-)

3rd version

Speed rpm : 500
Rack travel in mm : 8.50...8.70
Del.quantity cm³/ : 125.0
1000 s: (-)

Remarks:

: MAN-NR. 3-7023

* applies to cylinders 4, 5, 6, 8 ,10
and 12

** applies for cylinders 1, 2, 3, 7, 9

and 11

APPLICATION

Ship

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 21,9 x 2
 Edition : 19.10.90
 Replaces : 14.9.90
 Test oil : ISO-4113

Combination no. : 0 402 640 819

Injection pump
 Pump designation : PE12P120A320LS7807-3
 EP type number : 0 412 620 822
 Governor
 Governor design. : RQV350...1050PA842-6
 Governor no. : 0 421 813 853

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM 444 A

1st version kW : 390.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 150...170

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 9.00...12.00
 Firing order : 12- 1- 5- 9- 8- 3-
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-
 180-225-240-285-300-
 345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.50...13.70

Del.quantity cm³/ : 19.9...20.1

100 s: (19.6...20.4)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.4...5.6

Del.quantity cm³/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350
 travel mm : 0.70...1.20
 2nd speed rpm : 600
 travel mm : 3.10...3.60
 3rd speed rpm : 940
 travel mm : 5.20...5.70
 4th speed rpm : 1105
 travel mm : 6.70...7.20
 5th speed rpm : 1263
 travel mm : 9.80...10.30

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1150

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP**1st version**

Speed rpm : 600
 Aneroid pressure h: 660
 Del.quantity : 199.0...201.0
 1000 : (196.0...204.0)
 Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version
 Control lever
 position degrees: 107...115

Testing:

1st rack travel in: 11.20
 Speed rpm : 1090...1100
 2nd rack travel in: 4.00
 Speed rpm : 1155...1185
 4th rack travel in: 1250
 Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
 position degrees: 62...70

Testing:

Speed rpm : 250
 Minimum rack trave: 7.10
 Speed rpm : 350
 Rack travel in mm : 5.40...5.60

CONSTANT REGULATION

Speed rpm : 400...600

TORQUE CONTROL

Dimension a mm : 1.30
 Torque control curve - 1st version
 1st speed rpm : 1050
 Rack travel in m: 12.20...12.40
 2nd speed rpm : 975
 Rack travel in m: 12.60...12.80
 3rd speed rpm : 875
 Rack travel in m: 13.20...13.40
 4th speed rpm : 700
 Rack travel in m: 13.50...13.70

Aneroid/Altitude Compensator Test**1st version**

Setting
 Speed rpm : 600
 Pressure hPa : 660
 Rack travel mm : 13.50...13.70

Measurement

Speed 1/min : 600

1st pressure hPa : 350
 Rack travel in m: 11.30...11.50
 2nd pressure hPa : 500
 Rack travel in m: 12.80...13.00
 3rd pressure hPa : -
 Rack travel in m: 10.40...10.60

START CUT-OUT

Speed 1/min : 270 (290)

FUEL DELIVERY CHARACTERISTICS

1st version
 Aneroid pressure h: 1100
 Speed rpm : 1050
 Del.quantity cm³/ : 170.0...174.0
 1000 s: (167.0...177.0)
 Spread cm³ : 8.00
 1000 s: (12.0)
 Aneroid pressure h: 1100
 Speed rpm : 750
 Del.quantity cm³/ : 204.0...208.0
 1000 s: (201.0...211.0)
 Spread cm³ : 8.00
 1000 s: (12.0)
 Aneroid pressure h: 1100
 Speed rpm : 1050
 Del.quantity cm³/ : 150.0...154.0
 1000 s: (147.0...157.0)
 Spread cm³ : 8.00
 1000 s: (12.0)
 Aneroid pressure h: -
 Speed rpm : 500
 Del.quantity cm³/ : 136.0...138.0
 1000 s: (133.0...141.0)
 Spread cm³ : 8.00
 1000 s: (12.0)

BREAKAWAY

1st version
 1mm rack travel less than

full load rack tr: 11.20
 Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
 Del.quantity cm³/ : 220.0...240.0
 1000 s: (216.0...244.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 22,0 e
 Edition : 19.10.90
 Replaces : 20.7.90
 Test oil : ISO-4113

Combination no. : 0 402 640 820

Injection pump
 Pump designation : PE12P120A320LS7814-2
 EP type number : 0 412 620 824
 Governor
 Governor design. : RQ750PA966
 Governor no. : 0 421 801 535

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM 444 LA

1st version kW : 535.0
 Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 150...170

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90
 : (4.75...4.95)
 Rack travel in mm : 19.00...21.00
 Firing order : 12- 1- 5- 9- 8- 3-
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-
 180-225-240-285-300-
 345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 14.90...15.00

Del.quantity cm³/ : 31.6...31.8

100 s: (31.3...32.1)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.6...5.2

Del.quantity cm³/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm³ : 0.6

100 s: (1.0)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed	rpm	: 750
travel mm		: 1.00...1.50
2nd speed	rpm	: 791
travel mm		: 4.30...4.80
3rd speed	rpm	: 850
travel mm		: 11.10...11.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed	rpm	: 700
Del.quantity	1000	: 316.0...318.0
		: (313.0...321.0)
Spread	cm ³	: 5.00
	1000	: (9.00)

RATED SPEED

1st version
Control lever
position degrees: 76...84

Testing:

1st rack travel in: 13.90
Speed rpm : 755...760
2nd rack travel in: 4.00
Speed rpm : 785...795

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 13.90
Speed rpm : 755...760

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 275.0...295.0
1000 s: (271.0...299.0)

Remarks:

:

Observe VDT-I-420/120

APPLICATION

Generator

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 22,0 a 1
 Edition : 17.10.90
 Replaces : 31.7.90
 Test oil : ISO-4113

Combination no. : 0 402 640 821

Injection pump
 Pump designation : PE12P120A520LS7814
 EP type number : 0 412 620 813
 Governor
 Governor design. : RQV350...1050PA870-9
 Governor no. : 0 421 813 873

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM 444 LA

1st version kW : 588.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 150...170

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90
 : (4.75...4.95)
 Rack travel in mm : 19.00...21.00
 Firing order : 12- 1- 5- 9- 8- 3-
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-
 180-225-240-285-300-
 345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm : 650

Rack travel in mm : 13.00...13.20

Del.quantity cm³/ : 26.2...26.5

100 s: (25.9...26.8)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 350.0
 Rack travel in mm : 5.3...5.9
 Del.quantity cm³/ : 1.6...2.2
 100 s: (1.3...2.5)

Spread cm³ : 0.8
 100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed	rpm	: 350
travel mm		: 1.30...1.80
2nd speed	rpm	: 600
travel mm		: 3.30...3.80
3rd speed	rpm	: 900
travel mm		: 5.40...5.90
4th speed	rpm	: 1100
travel mm		: 7.60...8.10
5th speed	rpm	: 1200
travel mm		: 9.60...10.10

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1275

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 650
Aneroid pressure h: 1100
Del.quantity : 262.0...265.0
1000 : (259.0...268.0)
Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version

Control lever
position degrees: 113...121

Testing:

1st rack travel in: 11.80
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1160...1190
4th rack travel in: 1250
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 62...70

Testing:

Speed rpm : 250
Minimum rack trave: 7.30
Speed rpm : 350
Rack travel in mm : 5.30...5.90

CONSTANT REGULATION

Speed rpm : 350...600

TORQUE CONTROL

Dimension a mm : 0.90
Torque control curve - 1st version
1st speed rpm : 1050
Rack travel in m: 12.80...12.90
2nd speed rpm : 850
Rack travel in m: 13.70...13.90

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 650
Pressure hPa : 1100
Rack travel mm : 13.00...13.20

Measurement

Speed 1/min : 650

1st pressure hPa : 500
Rack travel in m: 9.50...9.70

2nd pressure hPa : 700
Rack travel in m: 11.10...11.30
3rd pressure hPa : 1400
Rack travel in m: 13.20...13.30
4th pressure hPa : 1500
Rack travel in m: 13.40...13.60
5th pressure hPa : -
Rack travel in m: 8.20...8.50

START CUT-OUT

Speed 1/min : 310 (330)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1850
Speed rpm : 1050
Del.quantity cm³/ : 261.0...264.0
1000 s: (258.0...267.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: 1850
Speed rpm : 750
Del.quantity cm³/ : 278.0...282.0
1000 s: (275.0...285.0)
Spread cm³ : -
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 130.0...132.0
1000 s: (127.0...135.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.80
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 260.0...280.0
1000 s: (256.0...284.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 22,0 e 2
 Edition : 17.10.90
 Replaces : -
 Test oil : ISO-4113

Combination no. : 0 402 640 822

Injection pump
 Pump designation : PE12P120A320LS7814-2
 EP type number : 0 412 620 824
 Governor
 Governor design. : RQ900PA966-1
 Governor no. : 0 421 801 550

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM 444 LA

1st version kW : 539.0
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 150...170

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90
 : (4.75...4.95)
 Rack travel in mm : 19.00...21.00
 Firing order : 12- 1- 5- 9- 8- 3-
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-
 180-225-240-285-300-
 345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 14.50...14.60

Del.quantity cm³/ : 29.4...29.6

100 s: (29.1...29.9)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.6...5.2

Del.quantity cm³/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm³ : 0.6

100 s: (1.0)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 935

travel mm : 4.60...5.10

2nd speed rpm : 1070

travel mm : 13.70...14.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Del.quantity : 294.0...296.0

1000 : (291.0...299.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever
position degrees: 77...85

Testing:

1st rack travel in: 13.50
Speed rpm : 905...910
2nd rack travel in: 4.00
Speed rpm : 940...950
4th rack travel in: 1000
Speed rpm : 0.00...1.00

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 13.50
Speed rpm : 905...910

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ 1000 s: 260.0...280.0
1000 s: (256.0...284.0)

Remarks:

:

APPLICATION

Generator

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 21,0 f
 Edition : 23.11.90
 Replaces : -
 Test oil : ISO-4113

Combination no. : 0 402 640 824

Injection pump
 Pump designation : PE12P120A520LS7824-1
 EP type number : 0 412 620 825
 Governor
 Governor design. : RQV250...1150PA977K
 Governor no. : 0 421 815 265

Customer-spec. information

Customer : MAN

Engine : D2842LXF

1st version kW : 735.0
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder assembly : 1 688 901 019

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness x Length mm : 6.00x1.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60
 : (4.45...4.65)
 Rack travel in mm : 9.00...12.00
 Firing order : 12- 1- 5- 9- 8- 3-
 : 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-
 : 180-225-240-285-300-
 Phasing : 345
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 13.70...13.80

Del.quantity cm³/ : 30.8...31.0

100 s: (30.5...31.3)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 300.0
 Rack travel in mm : 5.0...5.4
 Del.quantity cm³/ : 1.7...2.3
 100 s: (1.4...2.6)

Spread cm³ : 0.8
 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed	rpm	: 1195
travel mm		: 10.10...10.30
2nd speed	rpm	: 300
travel mm		: 1.00...1.20
3rd speed	rpm	: 550
travel mm		: 3.40...4.00
4th speed	rpm	: 900
travel mm		: 7.00...7.40
5th speed	rpm	: 1450
travel mm		: 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1215
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150
Aneroid pressure h: 1300
Del.quantity : 308.0...310.0
1000 : (305.0...313.0)
Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 295...303

Testing:

1st rack travel in: 12.70
Speed rpm : 1190...1200
2nd rack travel in: 4.00
Speed rpm : 1300...1330
4th rack travel in: 1450
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 246...254

Testing:

Speed rpm : 100
Minimum rack trave: 6.70
Speed rpm : 300
Rack travel in mm : 5.10...5.30

CONSTANT REGULATION

Speed rpm : 330...450

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 1150
Rack travel in m: 13.70...13.80
2nd speed rpm : 700
Rack travel in m: 12.10...12.30
3rd speed rpm : 900
Rack travel in m: 13.00...13.20

Aneroid/Altitude Compensator Test

1st version
Setting
Speed rpm : 1150
Pressure hPa : 1300
Rack travel mm : 13.70...13.80

Measurement
Speed 1/min : 1150

1st pressure hPa : -
Rack travel in m: 8.50...8.70
2nd pressure hPa : 250

Rack travel in m: 8.90...9.00
3rd pressure hPa : 650
Rack travel in m: 10.80...11.10

START CUT-OUT

Speed 1/min : 240 (260)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1300
Speed rpm : 700
Del.quantity cm³/ : 256.0...262.0
1000 s: (253.0...265.0)
Aneroid pressure h: 1300
Speed rpm : 900
Del.quantity cm³/ : 285.0...291.0
1000 s: (282.0...294.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 141.0...143.0
1000 s: (138.0...146.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 12.70
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 255.0...275.0
1000 s: (251.0...279.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 5.00...5.40
Del.quantity cm³/ : 17.0...23.0
1000 s: (14.0...26.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks: : MAN-NR. 3-7024

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,0 t
 Edition : 30.11.90
 Replaces : 16.2.90
 Test oil : ISO-4113

Combination no. : 0 402 646 838

Injection pump
 Pump designation : PE6P120A320LS7808
 EP type number : 0 412 626 816
 Governor
 Governor design. : RQ300/1050PA762-4
 Governer no. : 0 421 801 390

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 240.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.90...14.10

Del.quantity cm³/ : 21.4...21.6

100 s: (21.1...21.9)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.7...6.0

Del.quantity cm³/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm³ : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 900

Del.quantity : 214.0...216.0

1000 : (211.0...219.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.70
Speed rpm : 1095...1110
2nd rack travel in: 4.00
Speed rpm : 1165...1195
4th rack travel in: 1300
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.8

Testing:

Speed rpm : 200
Minimum rack trave: 7.70
Speed rpm : 300
Rack travel in mm : 5.70...6.00
Rack travel in mm : 2.00
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.30
2nd speed rpm : 1050
Rack travel in m: 14.70...14.90
3rd speed rpm : 800
Rack travel in m: 15.10...15.30

Aneroid/Altitude Compensator Test

1st version
Setting
Speed rpm : 600
Pressure hPa : 900
Rack travel mm : 13.90...14.10

Measurement
Speed 1/min : 600

1st pressure hPa : 300
Rack travel in m: 10.70...10.90
2nd pressure hPa : 550
Rack travel in m: 12.70...12.90
3rd pressure hPa : 1050
Rack travel in m: 14.00...14.10 *
4th pressure hPa : 1150
Rack travel in m: 14.40...14.70
5th pressure hPa : -
Rack travel in m: 9.50...9.80

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1350
Speed rpm : 1050
Del.quantity cm³/ : 236.0...239.0
1000 s: (233.0...242.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: 1350
Speed rpm : 800
Del.quantity cm³/ : 243.0...247.0
1000 s: (240.0...250.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 145.0...147.0
1000 s: (142.0...150.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 13.70
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 205.0...225.0
1000 s: (201.0...229.0)

Remarks:

* Increase in control-rod travel with respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 11,1 m
 Edition : 16.11.90
 Replaces : 5.3.90
 Test oil : ISO-4113

Combination no. : 0 402 646 872

Injection pump
 Pump designation : PE6P120A720RS7126Z
 EP type number : 0 412 626 830
 Governor
 Governor design. : RQV200...1000PA725-6
 Governer no. : 0 421 813 755

Customer-spec. information
 Customer : SAAB-SCANIA

Engine : DSC11 08

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10
 : (4.95...5.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.80...12.90

Del.quantity cm³/ : 20.4...20.6

100 s: (20.1...20.9)

Spread cm³ : 0.6

100 s: (0.9)

2nd speed rpm : 225.0

Rack travel in mm : 4.7...5.1

Del.quantity cm³/ : 1.8...2.2

100 s: (-)

Spread cm³ : 0.3

100 s: (0.6)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 225

travel mm : 1.20...1.60

2nd speed rpm : 350

travel mm : 2.40...3.00

3rd speed rpm : 650

travel mm : 4.40...5.00

4th speed rpm : 1045

travel mm : 8.40...8.60

5th speed rpm : 1150

travel mm : 9.70...10.10

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1170

Rack travel in mm : 6.00...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 204.0...206.0

1000 : (201.0...209.0)

Spread	cm ³	: 6.00	Del.quantity cm ³ /	: 142.0...146.0
	1000	: (9.00)	1000 s:	(140.0...148.0)
RATED SPEED				
1st version				
Control lever			BREAKAWAY	
position degrees:	113...121		1st version	
Testing:			1mm rack travel less than	
1st rack travel in:	11.80		full load rack tr:	11.80
Speed rpm	: 1040...1050		Speed rpm	: 1040...1050
2nd rack travel in:	4.00		STARTING FUEL DELIVERY	
Speed rpm	: 1140...1170		Speed rpm	: 100
4th rack travel in:	1300		Del.quantity cm ³ /	: 125.0...155.0
Speed rpm	: 0.00...1.00		1000 s:	(-)
LOW IDLE 1				
Control lever			Rack travel in mm	: 10.30...10.70
position degrees:	61...69		LOW IDLE	
Testing:			Speed rpm	: 225
Speed rpm	: 100		Rack travel in mm	: 4.70...4.90
Minimum rack trave:	6.30		Remarks:	
Speed rpm	: 225		Delivery-valve spring pre-tension	
Rack travel in mm	: 4.70...4.90		3.2...3.4 mm.	
Rack travel in mm	: 2.00		Permissible alteration of	3.0...3.5 mm
Speed rpm	: 350...410			
Aneroid/Altitude Compensator Test				
1st version			Because of flattening, set the spring	
Setting			preload on new delivery-valve holders	
Speed rpm	: 500		to 2.9...3.1 mm.	
Pressure hPa	: 900		ADDITIONAL INFORMATION	
Rack travel mm	: 12.80...12.90		Start-of-delivery setting with ROBO diaphragm.	
Measurement				
Speed 1/min	: 500		For comb. with letter index see	
1st pressure hPa	: -		VDT-I-400/116.	
Rack travel in m:	10.30...10.70		For sealing see VDT-I-400/117.	
2nd pressure hPa	: 470		Test specifications approved by Scania	
Rack travel in m:	12.40...12.50		on November 14, 1989	
3rd pressure hPa	: 320		Start of delivery - engine: 9° before	
Rack travel in m:	11.20...11.40		TDC	
FUEL DELIVERY CHARACTERISTICS				
1st version			Firing sequence of engine:	
Aneroid pressure h:	900		1-5-3-6-2-4.	
Speed rpm	: 1000			
Del.quantity cm ³ /	: 197.0...205.0			
1000 s:	(195.0...207.0)			
Aneroid pressure h:	-			
Speed rpm	: 500			

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,0 t 3
 Edition : 05.11.90
 Replaces : 20.10.89
 Test oil : ISO-4113

Combination no. : 0 402 646 888

Injection pump
 Pump designation : PE6P120A320LS7808-2
 EP type number : 0 412 626 833
 Governor
 Governor design. : RQV350..1050PA842-4
 Governer no. : 0 421 813 806

Customer-spec. information
 Customer : DAIMLER-BENZ

Engine : OM441 LA

1st version kW : 243.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.10...14.30

Del.quantity cm³/ : 22.0...22.2

100 s: (21.7...22.5)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.1...5.7

Del.quantity cm³/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm³ : 0.6

100 s: (1.0)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

travel mm : 1.40...1.60

2nd speed rpm : 800

travel mm : 3.90...4.30

3rd speed rpm : 1100

travel mm : 6.80...7.20

4th speed rpm : 1200

travel mm : 8.50...9.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1185

Rack travel in mm : 16.50...18.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 900
Del.quantity : 220.0...222.0
1000 : (217.0...225.0)
Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 111...119

Testing:

1st rack travel in: 13.90
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1180...1210
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 63...71

Testing:

Speed rpm : 200
Minimum rack trave: 7.30
Speed rpm : 350
Rack travel in mm : 5.10...5.70

CONSTANT REGULATION

Speed rpm : 350...600

TORQUE CONTROL

Dimension a mm : 0.50
2nd speed rpm : 1050
Rack travel in m: 14.90...15.10
3rd speed rpm : 1000
Rack travel in m: 15.10...15.30
4th speed rpm : 985
Rack travel in m: 15.30...15.50

Aneroid/Altitude Compensator Test

1st version
Setting
Speed rpm : 600
Pressure hPa : 900
Rack travel mm : 14.10...14.30

Measurement
Speed 1/min : 600

1st pressure hPa : 300
Rack travel in m: 10.20...10.40
2nd pressure hPa : 600
Rack travel in m: 12.80...13.00
3rd pressure hPa : 1250

Rack travel in m: 14.30...14.50
4th pressure hPa : 1350
Rack travel in m: 14.70...14.90
5th pressure hPa : -
Rack travel in m: 9.50...9.80

START CUT-OUT

Speed 1/min : 270 (290)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1500
Speed rpm : 1050
Del.quantity cm³/ : 242.0...246.0
1000 s: (239.0...249.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: 1500
Speed rpm : 800
Del.quantity cm³/ : 248.0...252.0
1000 s: (245.0...255.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 145.0...147.0
1000 s: (142.0...150.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 13.90
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 240.0...260.0
1000 s: (236.0...264.0)

Remarks:
:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 11.7 k1
 Edition : 16.11.90
 Replaces : 12.4.90
 Test oil : ISO-4113

Combination no. : 0 402 646 894

Injection pump
 Pump designation : PE6P120A320RS7194
 EP type number : 0 412 626 834
 Governor
 Governor design. : RQ250/1000PA936
 Governor no. : 0 421 801 507

Customer-spec. information

Customer : DAF

Engine : WS 295

1st version kW : 295.0
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder assembly : 1 688 901 105

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,8

Test Lines : 1 680 750 015

Outside diameter x Wall thickness x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 13.70...13.80

Del.quantity cm³/ : 23.9...24.1

100 s: (23.6...24.4)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 7.6...8.0

Del.quantity cm³/ : 2.2...2.8

100 s: (1.9...3.1)

Spread cm³ : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 550

Rack travel in mm : 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 1000

Del.quantity : 239.0...241.0

1000 : (236.0...244.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 550

Rack travel in mm : 15.8

Testing:

1st rack travel in: 12.70

Speed rpm : 1035...1050
2nd rack travel in: 4.00
Speed rpm : 1130...1160
4th rack travel in: 1250
Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 250
Rack travel in mm : 6.7

Testing:

Speed rpm : 100
Minimum rack trav: 8.20
Speed rpm : 250
Rack travel in mm : 6.60...6.80
Rack travel in mm : 2.00
Speed rpm : 345...385

TORQUE CONTROL

Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 850
Rack travel in m: 14.00...14.10
2nd speed rpm : 1000
Rack travel in m: 13.90...14.10

Aneroid/Altitude Compensator Test

1st version
Setting
Speed rpm : 600
Pressure hPa : 1000
Rack travel mm : 13.70...13.80

Measurement
Speed 1/min : 600

1st pressure hPa : -
Rack travel in m: 11.00...11.20
2nd pressure hPa : 460
Rack travel in m: 13.00...13.10
3rd pressure hPa : 310
Rack travel in m: 12.00...12.20

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: -
Speed rpm : 600
Del.quantity cm³/ 1000 s: 165.0...167.0
1000 s: (162.0...170.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 12.70
Speed rpm : 1035...1050

LOW IDLE

Speed rpm : 250
Rack travel in mm : 6.60...6.80

Remarks:

:
Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 11,7 k4
 Edition : 16.11.90
 Replaces : 17.5.90
 Test oil : ISO-4113

Combination no. : 0 402 646 896

Injection pump
 Pump designation : PE6P120A320RS7194
 EP type number : 0 412 626 834
 Governor
 Governor design. : RQV250...1000PA939
 Governor no. : 0 421 813 829

Customer-spec. information
 Customer : DAF

Engine : WS 295

1st version kW : 295.0
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test Lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.25)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 13.70...13.80

Del.quantity cm³/ : 23.9...24.1

100 s: (23.6...24.4)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 7.6...8.0

Del.quantity cm³/ : 2.2...2.8

100 s: (1.9...3.1)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 0.70...1.10

2nd speed rpm : 400

travel mm : 2.40...3.20

3rd speed rpm : 800

travel mm : 5.20...5.60

4th speed rpm : 1000

travel mm : 7.30...7.50

5th speed rpm : 1300

travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1060

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 1000

Del.quantity : 239.0...241.0
1000 : (236.0...244.0)
Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 115...123

Testing:

1st rack travel in: 12.70
Speed rpm : 1025...1040
2nd rack travel in: 4.00
Speed rpm : 1130...1160
4th rack travel in: 1250
Speed rpm : 0.00...1.40

LOW IDLE 1

Control lever
position degrees: 81...89

Testing:

Speed rpm : 100
Minimum rack trave: 8.20
Speed rpm : 250
Rack travel in mm : 6.60...6.80

CONSTANT REGULATION

Speed rpm : 275...385

Aneroid/Altitude Compensator Test

1st version
Setting
Speed rpm : 600
Pressure hPa : 1000
Rack travel mm : 13.70...13.80

Measurement

Speed 1/min : 600

1st pressure hPa : -
Rack travel in m: 11.00...11.20
2nd pressure hPa : 460
Rack travel in m: 13.00...13.10
3rd pressure hPa : 310
Rack travel in m: 12.00...12.20

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: -
Speed rpm : 600
Del.quantity cm³/ : 165.0...167.0
1000 s: (162.0...170.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 12.70
Speed rpm : 1025...1040

LOW IDLE

Speed rpm : 250
Rack travel in mm : 6.60...6.80

Remarks:

:
Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : FIA 13,8 W
 Edition : 30.11.90
 Replaces : 21.9.90
 Test oil : ISO-4113

Combination no. : 0 402 646 902

Injection pump
 Pump designation : PE6P130A720RS7197
 EP type number : 0 412 636 815
 Governor
 Governor design. : RQV300...900PA946
 Governor no. : 0 421 813 845

Customer-spec. information
 Customer : IVECO-UNIC

Engine : 8210.42.151

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10
 : (4.95...5.15)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.50...13.60

Del.quantity cm³/ : 25.5...25.8

100 s: (25.1...26.1)

Spread cm³ : 0.6

100 s: (1.0)

2nd speed rpm : 300.0

Rack travel in mm : 5.1...5.5

Del.quantity cm³/ : 1.9...2.5

100 s: (1.5...2.9)

Spread cm³ : 1.0

100 s: (1.4)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.00...1.40

2nd speed rpm : 450

travel mm : 2.80...3.40

3rd speed rpm : 700

travel mm : 5.50...5.90

4th speed rpm : 900

travel mm : 7.70...7.90

5th speed rpm : 1200

travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 970

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 900

Del.quantity : 255.0...258.0

1000 : (251.5...261.5)

Spread cm³ : 6.00
 1000 : (10.00)

Del.quantity cm³/ : 181.0...184.0
 1000 s: (177.5...187.5)

RATED SPEED

1st version
Control lever
position degrees: 118...126

Testing:
1st rack travel in: 12.50
Speed rpm : 940...950
2nd rack travel in: 4.00
Speed rpm : 1020...1050
4th rack travel in: 1200
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 76...84

Testing:
Speed rpm : 100
Minimum rack trave: 6.80
Speed rpm : 300
Rack travel in mm : 5.20...5.40

CONSTANT REGULATION
Speed rpm : 320...440

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 13.40...13.50

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.70...10.90
2nd pressure hPa : 345
Rack travel in m: 12.70...12.80
3rd pressure hPa : 275
Rack travel in m: 11.10...11.60

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 500
Del.quantity cm³/ : 269.0...276.0
 1000 s: (269.0...276.0)
Aneroid pressure h: -
Speed rpm : 500

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 12.50
Speed rpm : 940...950

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 240.0...280.0
 1000 s: (236.0...284.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 5.10...5.50
Del.quantity cm³/ : 19.0...25.0
 1000 s: (15.0...29.0)
Spread cm³ : 10.00
 1000 s: (14.00)

Remarks:

:
Check electrically unlatched starting
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,
the start position must be reached.

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 11.1 b3
 Edition : 15.11.90
 Replaces : -
 Test oil : ISO-4113

Combination no. : 0 402 646 903

Injection pump

Pump designation : PE6P120A720RS7126
 EP type number : 0 412 626 815
 Governor
 Governor design. : RQV200...1000PA725-8
 Governer no. : 0 421 813 885

Customer-spec. information

Customer : SCANIA

Engine : DSC11 30

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder assembly : 1 688 901 019

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter x Wall thickness x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10
 : (4.95...5.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 14.20...14.30

Del.quantity cm³/ : 24.0...24.2

100 s: (23.7...24.5)

Spread cm³ : 0.6

100 s: (0.9)

2nd speed rpm : 225.0

Rack travel in mm : 4.7...5.1

Del.quantity cm³/ : 1.8...2.2

100 s: (-)

Spread cm³ : 0.3

100 s: (0.6)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 225

travel mm : 1.20...1.60

2nd speed rpm : 350

travel mm : 2.40...3.00

3rd speed rpm : 650

travel mm : 4.40...5.00

4th speed rpm : 1045

travel mm : 8.40...8.60

5th speed rpm : 1150

travel mm : 9.70...10.10

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1170

Rack travel in mm : 6.00...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 240.0...242.0

1000 : (237.0...245.0)

Spread cm³ : 6.00
 1000 : (9.00)

Del.quantity cm³/ : 142.0...146.0
 1000 s: (140.0...148.0)

RATED SPEED

1st version
Control lever
position degrees: 113...121

Testing:
1st rack travel in: 13.20
Speed rpm : 1040...1050
2nd rack travel in: 4.00
Speed rpm : 1150...1180
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 61...69

Testing:
Speed rpm : 100
Minimum rack trave: 6.30
Speed rpm : 225
Rack travel in mm : 4.70...4.90
Rack travel in mm : 2.00
Speed rpm : 350...410

Aneroid/Altitude Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 14.20...14.30

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.30...10.70
2nd pressure hPa : 470
Rack travel in m: 13.20...13.30
3rd pressure hPa : 225
Rack travel in m: 11.30...11.50

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 1000
Del.quantity cm³/ : 226.0...234.0
 1000 s: (224.0...236.0)
Aneroid pressure h: -
Speed rpm : 500

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 13.20
Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 125.0...155.0
 1000 s: (-)

Rack travel in mm : 10.30...10.70

LOW IDLE

Speed rpm : 225
Rack travel in mm : 4.70...4.90

Remarks:
Delivery-valve spring pre-tension
3.2...3.4 mm.
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring
preload on new delivery-valve holders
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO
diaphragm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11.0 t 7
 Edition : 16.11.90
 Replaces : 5.10.90
 Test oil : ISO-4113

Combination no. : 0 402 646 908

Injection pump
 Pump designation : PE6P120A320LS7808
 EP type number : 0 412 626 816
 Governor
 Governor design. : RQ300/950PA932-3
 Governor no. : 0 421 801 528

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 249.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.90...14.10

Del.quantity cm³/ : 21.4...21.6

100 s: (21.1...21.9)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.7...6.0

Del.quantity cm³/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm³ : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 900

Del.quantity : 214.0...216.0

1000 : (211.0...219.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:
1st rack travel in: 13.80
Speed rpm : 990...1005
2nd rack travel in: 4.00
Speed rpm : 1065...1095
4th rack travel in: 1200
Speed rpm : 0.00...1.50

LOW IDLE 1
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.8

Testing:
Speed rpm : 200
Minimum rack trave: 7.70
Speed rpm : 300
Rack travel in mm : 5.70...6.00
Rack travel in mm : 2.00
Speed rpm : 380...420

Aneroid/Altitude Compensator Test

1st version
Setting
Speed rpm : 600
Pressure hPa : 900
Rack travel mm : 13.90...14.10

Measurement
Speed 1/min : 600

1st pressure hPa : 300
Rack travel in m: 11.00...11.20
2nd pressure hPa : 550
Rack travel in m: 13.30...13.50
3rd pressure hPa : 1100
Rack travel in m: 14.10...14.20
4th pressure hPa : 1200
Rack travel in m: 14.50...14.70
5th pressure hPa : -
Rack travel in m: 9.40...9.70

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1350
Speed rpm : 950
Del.quantity cm3/ : 241.0...243.0
1000 s: (238.0...246.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: 1350
Speed rpm : 800
Del.quantity cm3/ : 239.0...244.0
1000 s: (236.0...247.0)

Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 145.0...147.0
1000 s: (142.0...150.0)
Spread cm3 : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 13.80
Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100
Rack travel in mm : 13.00...13.50

Remarks:
:

Adjust full-load delivery by turning
temperature-dependent excess-fuel stop
for starting (TAS).

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 11,7 L
 Edition : 16.11.90
 Replaces : 20.7.90
 Test oil : ISO-4113

Combination no. : 0 402 646 912

Injection pump
 Pump designation : PE6P120A320RS7218
 EP type number : 0 412 626 839
 Governor
 Governor design. : RQ250/1000PA936-1
 Governor no. : 0 421 801 508

Customer-spec. information

Customer : DAF

Engine : WS 268

1st version kW : 268.0
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test Lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 5.30...5.40
 (5.25...5.45)
 Rack travel in mm : 14.50...15.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10
 & maximum rack tra: 14.5...15.5
 Difference ° CS : 2.25...3.75

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 15.00...15.10

Del.quantity cm³/ : 23.5...23.7

100 s: (23.2...24.0)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 6.6...7.0

Del.quantity cm³/ : 3.1...3.7

100 s: (2.8...4.0)

Spread cm³ : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 550

Rack travel in mm : 15.80...17.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 1000

Del.quantity : 235.0...237.0

1000 : (232.0...240.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:
Speed rpm : 550
Rack travel in mm : 16.4

Aneroid pressure h: -
Speed rpm : 600
Del.quantity cm³/ : 164.0...168.0
1000 s: (162.0...170.0)

Testing:
1st rack travel in: 14.00
Speed rpm : 1035...1050
2nd rack travel in: 4.00
Speed rpm : 1140...1170
4th rack travel in: 1250
Speed rpm : 0.00...2.00

BREAKAWAY
1st version
1mm rack travel less than
full load rack tr: 14.00
Speed rpm : 1035...1050

LOW IDLE 1
Setting point w/out bumper spring
Speed rpm : 250
Rack travel in mm : 5.0

LOW IDLE
Speed rpm : 250
Rack travel in mm : 4.90...5.10

Testing:
Speed rpm : 100
Minimum rack trave: 7.00
Speed rpm : 250
Rack travel in mm : 4.90...5.10
Rack travel in mm : 2.00
Speed rpm : 310...350

Remarks:
Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

TORQUE CONTROL
Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 850
Rack travel in m: 15.30...15.40
2nd speed rpm : 1000
Rack travel in m: 15.20...15.40

Aneroid/Altitude Compensator Test

1st version
Setting
Speed rpm : 600
Pressure hPa : 1000
Rack travel mm : 15.00...15.10

Measurement
Speed 1/min : 600

1st pressure hPa : -
Rack travel in m: 12.40...12.60
2nd pressure hPa : 480
Rack travel in m: 14.20...14.30
3rd pressure hPa : 330
Rack travel in m: 13.20...13.40

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 600
Del.quantity cm³/ : 99.0...109.0
1000 s: (95.0...113.0)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 11.7 l1
 Edition : 23.11.90
 Replaces : 6.7.90
 Test oil : ISO-4113
 Combination no. : 0 402 646 913
 Injection pump
 Pump designation : PE6P120A320RS7218
 EP type number : 0 412 626 839
 Governor
 Governor design. : RQV250...1000PA939
 Governer no. : 0 421 813 829
 Customer-spec. information
 Customer : DAF
 Engine : WS 268
 1st version kW : 268.0
 Rated speed : 2000
TEST BENCH REQUIREMENTS
 Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 025
 Inlet press., bar : 1.50
 Test nozzle holder assembly : 1 688 901 105
 Opening pressure, bar : 207...210
 Orifice plate diameter mm : 0,8
 Test lines : 1 680 750 015
 Outside diameter x Wall thickness x Length mm : 6.00x1.50x600
(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 5.30...5.40
 : (5.25...5.45)
 Rack travel in mm : 14.50...15.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10
 & maximum rack tra: 14.5...15.5
 Difference ° CS : 2.25...3.75

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 15.00...15.10

Del.quantity cm³/ : 23.5...23.7

100 s: (23.2...24.0)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 250.0
 Rack travel in mm : 6.6...7.0
 Del.quantity cm³/ : 3.1...3.7
 100 s: (2.8...4.0)
 Spread cm³ : 0.8
 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed	rpm	: 1045
	travel mm	: 7.80...8.00
2nd speed	rpm	: 250
	travel mm	: 0.70...1.10
3rd speed	rpm	: 400
	travel mm	: 2.50...3.10
4th speed	rpm	: 700
	travel mm	: 4.50...4.90
5th speed	rpm	: 1350
	travel mm	: 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1125

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850
Aneroid pressure h: 1000
Del.quantity : 235.0...237.0
1000 : (232.0...240.0)
Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version

Control lever
position degrees: 118...126

Testing:

1st rack travel in: 14.00
Speed rpm : 1040...1050
2nd rack travel in: 4.00
Speed rpm : 1160...1190
4th rack travel in: 1250
Speed rpm : 0.00...1.40

LOW IDLE 1

Control lever
position degrees: 78...86

Testing:

Speed rpm : 100
Minimum rack trave: 7.00
Speed rpm : 250
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

Speed rpm : 270...380

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 600
Pressure hPa : 1000
Rack travel mm : 15.00...15.10

Measurement

Speed 1/min : 600

1st pressure hPa : -
Rack travel in m: 12.40...12.60
2nd pressure hPa : 480
Rack travel in m: 14.20...14.30
3rd pressure hPa : 330
Rack travel in m: 13.20...13.40

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600
Del.quantity cm³/ 1000 s: 99.0...109.0
cm³ : (95.0...113.0)
Spread cm³ : 10.00
1000 s: (14.00)
Aneroid pressure h: -
Speed rpm : 600
Del.quantity cm³/ 1000 s: 164.0...168.0
cm³ : (162.0...170.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 14.00
Speed rpm : 1040...1050

LOW IDLE

Speed rpm : 250
Rack travel in mm : 4.90...5.10

Remarks:

:
Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : UNI 13,8 g
 Edition : 05.11.90
 Replaces : 17.9.90
 Test oil : ISO-4113

Combination no. : 0 402 646 914

Injection pump
 Pump designation : PE6P130A720RS7197
 EP type number : 0 412 636 815
 Governor
 Governor design. : RQ300/900PA968
 Governor no. : 0 421 801 540

Customer-spec. information
 Customer : IVECO-UNIC

Engine : 8210.42.153

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test Lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10
 : (4.95...5.15)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.50...13.60

Del.quantity cm³/ : 25.5...25.8

100 s: (25.1...26.1)

Spread cm³ : 0.6

100 s: (1.0)

2nd speed rpm : 300.0

Rack travel in mm : 5.1...5.5

Del.quantity cm³/ : 1.9...2.5

100 s: (1.5...2.9)

Spread cm³ : 1.0

100 s: (1.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 900

Del.quantity : 255.0...258.0

1000 : (251.5...261.5)

Spread cm³ : 6.00

1000 : (10.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.50

Speed rpm : 945...960

2nd rack travel in: 4.00

Speed rpm : 1070...1100

4th rack travel in: 1250
Speed rpm : 0.00...1.00

LOW IDLE 1
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.3

Testing:
Speed rpm : 100
Minimum rack trave: 6.80
Speed rpm : 300
Rack travel in mm : 5.20...5.40
Rack travel in mm : 2.00
Speed rpm : 380...420

TORQUE CONTROL
Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 900
Rack travel in m: 13.50...13.60
2nd speed rpm : 600
Rack travel in m: 13.50...13.70

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 13.50...13.60

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.70...10.90
2nd pressure hPa : 345
Rack travel in m: 12.70...12.80
3rd pressure hPa : 275
Rack travel in m: 11.10...11.60

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 500
Del.quantity cm3/ : 269.0...276.0
1000 s: (269.0...276.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 181.0...184.0
1000 s: (177.5...187.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 12.50
Speed rpm : 945...960

INTERMEDIATE RATED SPEED
Rack travel in mm : 4.00

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 240.0...270.0
1000 s: (236.0...274.0)

LOW IDLE
Speed rpm : 300
Rack travel in mm : 5.10...5.50
Del.quantity cm3/ : 19.0...25.0
1000 s: (15.0...29.0)
Spread cm3 : 10.00
1000 s: (14.00)

Remarks:
:
Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

APPLICATION

Omnibus

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 9,6 o
 Edition : 23.11.90
 Replaces : -
 Test oil : ISO-4113

Combination no. : 0 402 646 917

Injection pump
 Pump designation : PE6P120A320LS7834
 EP type number : 0 412 626 841
 Governor
 Governor design. : RQ300/950PA971
 Governor no. : 0 421 801 543

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 230.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60
 : (5.45...5.65)
 Rack travel in mm : 20.00...21.00
 Firing order : 6-3-5-2-4-1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.70...14.90

Del.quantity cm³/ : 21.9...22.1

100 s: (21.6...22.4)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.5...6.8

Del.quantity cm³/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm³ : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1000

Del.quantity : 219.0...221.0

1000 : (216.0...224.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:
1st rack travel in: 13.90
Speed rpm : 990...1005
2nd rack travel in: 4.00
Speed rpm : 1065...1095
4th rack travel in: 1200
Speed rpm : 0.00...1.50

LOW IDLE 1
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.6

Testing:
Speed rpm : 200
Minimum rack trave: 8.50
Speed rpm : 300
Rack travel in mm : 6.50...6.80
Rack travel in mm : 2.00
Speed rpm : 380...420

TORQUE CONTROL
Dimension a mm : 0.35
2nd speed rpm : 950
Rack travel in m: 14.90...15.10
3rd speed rpm : 800
Rack travel in m: 15.30...15.50

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 600
Pressure hPa : 900
Rack travel mm : 14.70...14.90

Measurement
Speed 1/min : 600

1st pressure hPa : 300
Rack travel in m: 11.50...11.70
2nd pressure hPa : 550
Rack travel in m: 13.90...14.10
3rd pressure hPa : 1350
Rack travel in m: 14.80...15.00 *
4th pressure hPa : -
Rack travel in m: 9.50...9.80

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1600
Speed rpm : 950
Del.quantity cm3/ : 234.0...236.0
1000 s: (231.0...239.0)

Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: 1600
Speed rpm : 800
Del.quantity cm3/ : 241.0...244.0
1000 s: (238.0...247.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 125.0...127.0
1000 s: (122.0...130.0)
Spread cm3 : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 13.90
Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100

Remarks:

* Increase in control-rod travel with
respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,0 t 8
 Edition : 05.11.90
 Replaces : -
 Test oil : ISO-4113

Combination no. : 0 402 646 919

Injection pump
 Pump designation : PE6P120A320LS7808
 EP type number : 0 412 626 816
 Governor
 Governor design. : RQ300/950PA762-13
 Governer no. : 0 421 801 544

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 250.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.10...14.30

Del.quantity cm³/ : 21.6...21.8

100 s: (21.3...22.1)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 300.0
 Rack travel in mm : 5.7...6.0
 Del.quantity cm³/ : 1.6...2.2
 100 s: (1.3...2.5)

Spread cm³ : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 750

Del.quantity : 216.0...218.0

1000 : (213.0...221.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 14.30
Speed rpm : 1090...1105
2nd rack travel in: 4.00
Speed rpm : 1175...1205
4th rack travel in: 1300
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.8

Testing:

Speed rpm : 200
Minimum rack trave: 7.70
Speed rpm : 300
Rack travel in mm : 5.70...6.00
Rack travel in mm : 2.00
Speed rpm : 380...420

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 600
Pressure hPa : 750
Rack travel mm : 14.10...14.30

Measurement

Speed 1/min : 600

1st pressure hPa : 200
Rack travel in m: 10.30...10.50
2nd pressure hPa : 500
Rack travel in m: 13.00...13.20
3rd pressure hPa : 950
Rack travel in m: 14.20...14.40
4th pressure hPa : 1150
Rack travel in m: 14.80...15.00
5th pressure hPa : -
Rack travel in m: 9.20...9.50

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1350
Speed rpm : 1050
Del.quantity cm³/ : 243.0...245.0
1000 s: (240.0...248.0)
Spread cm³ : 8.00
1000 s: (12.0)

Aneroid pressure h: 1350

Speed rpm : 750
Del.quantity cm³/ : 239.0...243.0
1000 s: (236.0...246.0)
Spread cm³ : 8.00
1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500
Del.quantity cm³/ : 134.0...136.0
1000 s: (131.0...139.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 14.30
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 210.0...230.0
1000 s: (206.0...234.0)

Remarks:

:

* Increase in control-rod travel with
respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,0 t 9
 Edition : 30.11.90
 Replaces : -
 Test oil : ISO-4113

Combination no. : 0 402 646 920

Injection pump
 Pump designation : PE6P120A320S7808
 EP type number : 0 412 626 816
 Governor
 Governor design. : RQ300/950PA971-1
 Governer no. : 0 421 801 547

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 250.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test Lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.90...14.10

Del.quantity cm³/ : 22.1...22.3

100 s: (21.8...22.6)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.7...6.0

Del.quantity cm³/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm³ : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 950

Del.quantity : 221.0...223.0

1000 : (218.0...226.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:
 1st rack travel in: 14.10
 Speed rpm : 990...1005
 2nd rack travel in: 4.00
 Speed rpm : 1065...1095
 4th rack travel in: 1150
 Speed rpm : 0.00...1.50

LOW IDLE 1
 Setting point w/out bumper spring
 Speed rpm : 300
 Rack travel in mm : 5.8

Testing:
 Speed rpm : 200
 Minimum rack trave: 7.70
 Speed rpm : 300
 Rack travel in mm : 5.70...6.00
 Rack travel in mm : 2.00
 Speed rpm : 380...420

Aneroid/Altitude Compensator Test

1st version
 Setting
 Speed rpm : 600
 Pressure hPa : 900
 Rack travel mm : 13.90...14.10

Measurement
 Speed 1/min : 600

1st pressure hPa : 350
 Rack travel in m: 10.70...10.90
 2nd pressure hPa : 600
 Rack travel in m: 12.80...13.00
 3rd pressure hPa : 1150
 Rack travel in m: 14.20...14.40
 4th pressure hPa : 1250
 Rack travel in m: 14.70...14.90
 5th pressure hPa : -
 Rack travel in m: 9.20...9.50

FUEL DELIVERY CHARACTERISTICS

1st version
 Aneroid pressure h: 1550
 Speed rpm : 950
 Del.quantity cm3/ : 251.0...254.0
 1000 s: (248.0...257.0)
 Spread cm3 : 8.00
 1000 s: (12.0)
 Aneroid pressure h: 1550
 Speed rpm : 750
 Del.quantity cm3/ : 242.0...246.0
 1000 s: (239.0...249.0)

Spread cm3 : 8.00
 1000 s: (12.0)
 Aneroid pressure h: -
 Speed rpm : 500
 Del.quantity cm3/ : 138.0...140.0
 1000 s: (135.0...143.0)
 Spread cm3 : 8.00
 1000 s: (12.0)

BREAKAWAY

1st version
 1mm rack travel less than

full load rack tr: 14.10
 Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100

Remarks:

:
 Adjust full-load delivery by turning temperature-dependent excess-fuel stop for starting (TAS).

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 9,6 p
 Edition : 05.11.90
 Replaces : -
 Test oil : ISO-4113

Combination no. : 0 402 646 924

Injection pump
 Pump designation : PE6P120A320LS7837
 EP type number : 0 412 626 842
 Governor
 Governor design. : RQ300/950PA971-3
 Governor no. : 0 421 801 557

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 250.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.30...14.50

Del.quantity cm³/ : 22.7...22.9

100 s: (22.4...23.2)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.7...6.0

Del.quantity cm³/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm³ : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 900

Del.quantity : 227.0...229.0

1000 : (224.0...232.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:
1st rack travel in: 14.20
Speed rpm : 990...1005
2nd rack travel in: 4.00
Speed rpm : 1065...1095
4th rack travel in: 1200
Speed rpm : 0.00...1.50

LOW IDLE 1
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.8

Testing:
Speed rpm : 200
Minimum rack trave: 7.70
Speed rpm : 300
Rack travel in mm : 5.70...6.00
Rack travel in mm : 2.00
Speed rpm : 380...420

Aneroid/Altitude Compensator Test

1st version
Setting
Speed rpm : 600
Pressure hPa : 900
Rack travel mm : 14.30...14.50

Measurement
Speed 1/min : 600

1st pressure hPa : 400
Rack travel in m: 10.90...11.10
2nd pressure hPa : 640
Rack travel in m: 13.40...13.60
3rd pressure hPa : 1240
Rack travel in m: 14.40...14.60 *
4th pressure hPa : 1500
Rack travel in m: 15.00...15.20

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1700
Speed rpm : 950
Del.quantity cm3/ : 252.0...254.0
1000 s: (249.0...257.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: 1700
Speed rpm : 800
Del.quantity cm3/ : 263.0...265.0
1000 s: (260.0...268.0)
Spread cm3 : 8.00
1000 s: (12.0)

Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 135.0...137.0
1000 s: (132.0...140.0)
Spread cm3 : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 14.20
Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100

Remarks:
:

* Increase in control-rod travel with
respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,1 b
 Edition : 30.11.90
 Replaces : -
 Test oil : ISO-4113

Combination no. : 0 402 646 925

Injection pump
 Pump designation : PE6P120A320LS7837
 EP type number : 0 412 626 842
 Governor
 Governor design. : RQV300...950PA797-20
 Governor no. : 0 421 813 893

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 252.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.30...14.50

Del.quantity cm³/ : 22.7...22.9

100 s: (22.4...23.2)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.2

Del.quantity cm³/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm³ : 0.6

100 s: (1.0)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed	rpm	: 300
	travel mm	: 1.00...1.50
2nd speed	rpm	: 567
	travel mm	: 4.40...4.90
3rd speed	rpm	: 780
	travel mm	: 6.10...6.60
4th speed	rpm	: 1009
	travel mm	: 8.30...8.80
5th speed	rpm	: 1190
	travel mm	: 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1025

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 600
 Aneroid pressure h: 900
 Del.quantity : 227.0...229.0
 1000 : (224.0...232.0)
 Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version
 Control lever
 position degrees: 120...128

Testing:
 1st rack travel in: 14.20
 Speed rpm : 990...1000
 2nd rack travel in: 4.00
 Speed rpm : 1085...1115
 4th rack travel in: 1200
 Speed rpm : 0.00...1.00

LOW IDLE 1
 Control lever
 position degrees: 82...90

Testing:
 Speed rpm : 200
 Minimum rack trave: 8.40
 Speed rpm : 300
 Rack travel in mm : 5.90...6.20

CONSTANT REGULATION
 Speed rpm : 300...500

TORQUE CONTROL
 Dimension a mm : 0.50
 2nd speed rpm : 950
 Rack travel in m: 15.20...15.40
 3rd speed rpm : 800
 Rack travel in m: 15.70...15.90

Aneroid/Altitude Compensator Test

1st version
 Setting
 Speed rpm : 600
 Pressure hPa : 900
 Rack travel mm : 14.30...14.50

Measurement
 Speed 1/min : 600

1st pressure hPa : 400
 Rack travel in m: 11.30...11.50
 2nd pressure hPa : 640
 Rack travel in m: 13.40...13.60
 3rd pressure hPa : 1240

Rack travel in m: 14.40...14.60 *
 4th pressure hPa : 1360
 Rack travel in m: 15.00...15.20
 5th pressure hPa : -
 Rack travel in m: 8.80...9.10

START CUT-OUT

Speed 1/min : 240 (260)

FUEL DELIVERY CHARACTERISTICS

1st version
 Aneroid pressure h: 1700
 Speed rpm : 950
 Del.quantity cm³/s : 252.0...254.0
 1000 s: (249.0...257.0)
 Spread cm³ : 8.00
 1000 s: (12.0)
 Aneroid pressure h: 1700
 Speed rpm : 800
 Del.quantity cm³/s : 263.0...265.0
 1000 s: (260.0...268.0)
 Spread cm³ : 8.00
 1000 s: (12.0)
 Aneroid pressure h: -
 Speed rpm : 500
 Del.quantity cm³/s : 135.0...137.0
 1000 s: (132.0...140.0)
 Spread cm³ : 8.00
 1000 s: (12.0)

BREAKAWAY

1st version
 1mm rack travel less than
 full load rack tr: 14.20
 Speed rpm : 990...1000

STARTING FUEL DELIVERY

Speed rpm : 100
 Del.quantity cm³/s : 250.0...270.0
 1000 s: (246.0...274.0)

Remarks:

* Increase in control-rod travel with respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 9,6 o 1
 Edition : 30.11.90
 Replaces : -
 Test oil : ISO-4113

Combination no. : 0 402 646 926

Injection pump
 Pump designation : PE6P120A320LS7834
 EP type number : 0 412 626 841
 Governor
 Governor design. : RQV300...950PA797-19
 Governor no. : 0 421 813 901

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 230.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60
 : (5.45...5.65)
 Rack travel in mm : 20.00...21.00
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.80...14.00

Del.quantity cm³/ : 21.9...22.1

100 s: (21.6...22.4)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 300.0
 Rack travel in mm : 5.7...6.0
 Del.quantity cm³/ : 1.6...2.2
 100 s: (1.3...2.5)

Spread cm³ : 0.6
 100 s: (1.0)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed	rpm	: 300
	travel mm	: 1.00...1.50
2nd speed	rpm	: 617
	travel mm	: 5.00...5.50
3rd speed	rpm	: 780
	travel mm	: 6.10...6.60
4th speed	rpm	: 1009
	travel mm	: 8.30...8.80
5th speed	rpm	: 1092
	travel mm	: 9.80...10.30

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 980

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 600
Aneroid pressure h: 900
Del.quantity : 219.0...221.0
1000 : (216.0...224.0)
Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 118...126

Testing:

1st rack travel in: 13.40
Speed rpm : 990...1000
2nd rack travel in: 4.00
Speed rpm : 1065...1095
4th rack travel in: 1200
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 53...61

Testing:

Speed rpm : 200
Minimum rack trave: 7.70
Speed rpm : 300
Rack travel in mm : 5.70...6.00

CONSTANT REGULATION

Speed rpm : 300...500

Aneroid/Altitude Compensator Test

1st version
Setting
Speed rpm : 600
Pressure hPa : 900
Rack travel mm : 13.80...14.00

Measurement

Speed 1/min : 600

1st pressure hPa : 300
Rack travel in m: 10.60...10.80
2nd pressure hPa : 550
Rack travel in m: 12.60...12.80
3rd pressure hPa : 1350
Rack travel in m: 13.90...14.10 *
4th pressure hPa : 1500
Rack travel in m: 14.30...14.50

START CUT-OUT

Speed 1/min : 240 (260)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1600
Speed rpm : 950
Del.quantity cm³/ : 234.0...236.0
1000 s: (231.0...239.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: 1600
Speed rpm : 800
Del.quantity cm³/ : 241.0...244.0
1000 s: (238.0...247.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 125.0...127.0
1000 s: (122.0...130.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 13.40
Speed rpm : 990...1000

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 210.0...230.0
1000 s: (206.0...234.0)

Remarks:

:

* Increase in control-rod travel with
respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 14,7 q
 Edition : 23.11.90
 Replaces : 31.7.90
 Test oil : ISO-4113

Combination no. : 0 402 648 864

Injection pump
 Pump designation : PE8P120A320LS7816
 EP type number : 0 412 628 829
 Governor
 Governor design. : RQ300/950PA762-7
 Governor no. : 0 421 801 480

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 353.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 8-7-2-6-3-5-
 4-1

Phasing : 0-45-90-135-180-225-
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.60...14.80

Del.quantity cm³/ : 25.4...25.6

100 s: (25.1...25.9)

Spread cm³ : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.5

Del.quantity cm³/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm³ : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1000

Del.quantity : 254.0...256.0

1000 : (251.0...259.0)

Spread cm³ : 6.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 14.20
Speed rpm : 990...1005
2nd rack travel in: 4.00
Speed rpm : 1070...1100
4th rack travel in: 1150
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.2

Testing:

Speed rpm : 200
Minimum rack trave: 7.80
Speed rpm : 300
Rack travel in mm : 5.90...6.50
Rack travel in mm : 2.00
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.90
2nd speed rpm : 950
Rack travel in m: 15.20...15.40
3rd speed rpm : 800
Rack travel in m: 15.50...15.70

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 600
Pressure hPa : 1000
Rack travel mm : 14.60...14.80

Measurement

Speed 1/min : 600

1st pressure hPa : 350
Rack travel in m: 12.20...12.40
2nd pressure hPa : 700
Rack travel in m: 13.80...14.00
3rd pressure hPa : 1200
Rack travel in m: 14.80...15.00
4th pressure hPa : 1500
Rack travel in m: 15.50...15.70
5th pressure hPa : -
Rack travel in m: 10.20...10.50

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1600
Speed rpm : 950
Del.quantity cm³/ : 270.0...273.0
1000 s: (267.0...276.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: 1600
Speed rpm : 800
Del.quantity cm³/ : 270.0...274.0
1000 s: (267.0...277.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 145.0...147.0
1000 s: (142.0...150.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 14.20
Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 240.0...260.0
1000 s: (236.0...264.0)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 14,7 k 1
 Edition : 23.11.90
 Replaces : 31.7.90
 Test oil : ISO-4113

Combination no. : 0 402 648 881

Injection pump
 Pump designation : PE8P120A320LS7816
 EP type number : 0 412 628 829
 Governor
 Governor design. : RQV300...950PA797-13
 Governer no. : 0 421 813 841

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 353.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 8- 7- 2- 6- 3- 5-
 4- 1

Phasing : 0-45-90-135-180-225-
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.60...14.80

Del.quantity cm³/ : 25.4...25.6

100 s: (25.1...25.9)

Spread cm³ : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.5

Del.quantity cm³/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm³ : 0.6

100 s: (1.0)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed	rpm	: 300
travel mm		: 1.10...1.40
2nd speed	rpm	: 700
travel mm		: 5.50...6.00
3rd speed	rpm	: 1100
travel mm		: 8.30...8.80
4th speed	rpm	: 1090
travel mm		: 9.70...10.20
5th speed	rpm	: 1190
travel mm		: 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1000

Rack travel in mm : 16.20...18.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 600
Aneroid pressure h: 1000
Del.quantity : 254.0...256.0
1000 : (251.0...259.0)
Spread cm³ : 6.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 120...128

Testing:
1st rack travel in: 14.20
Speed rpm : 990...1000
2nd rack travel in: 4.00
Speed rpm : 1070...1100
4th rack travel in: 1150
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 82...90

Testing:
Speed rpm : 200
Minimum rack trave: 7.80
Speed rpm : 300
Rack travel in mm : 5.90...6.50

CONSTANT REGULATION
Speed rpm : 300...500

TORQUE CONTROL
Dimension a mm : 0.30
2nd speed rpm : 950
Rack travel in m: 15.20...15.40
3rd speed rpm : 800
Rack travel in m: 15.50...15.70

Aneroid/Altitude Compensator Test

1st version
Setting
Speed rpm : 600
Pressure hPa : 1000
Rack travel mm : 14.60...14.80

Measurement
Speed 1/min : 600

1st pressure hPa : 350
Rack travel in m: 12.00...12.20
2nd pressure hPa : 700
Rack travel in m: 13.80...14.00

3rd pressure hPa : 1200
Rack travel in m: 14.80...15.00
4th pressure hPa : 1500
Rack travel in m: 15.50...15.70
5th pressure hPa : -
Rack travel in m: 10.20...10.50

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1600
Speed rpm : 950
Del.quantity cm³/s : 270.0...273.0
1000 s: (267.0...276.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: 1600
Speed rpm : 800
Del.quantity cm³/s : 270.0...274.0
1000 s: (267.0...277.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/s : 145.0...147.0
1000 s: (142.0...150.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 14.20
Speed rpm : 990...1000

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/s : 240.0...260.0
1000 s: (236.0...264.0)

Remarks:
:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MTU 14,6 a1
 Edition : 16.11.90
 Replaces : 31.7.90
 Test oil : ISO-4113

 Combination no. : 0 402 648 884

 Injection pump
 Pump designation : PE8P120A320LS7830
 EP type number : 0 412 628 844
 Governor
 Governor design. : RQV350...1150PA870-
 10
 Governor no. : 0 421 813 879

 Customer-spec. information
 Customer : MTU

 Engine : 8V 183 TE92

 1st version kW : 490.0
 Rated speed : 2300

TEST BENCH REQUIREMENTS

 Test oil
 inlet temp. °C : 38...42

 Overflow valve : 1 417 413 025

 Inlet press., bar : 1.50

 Overflow
 quantity min. 1/h: 100...120

 Test nozzle holder
 assembly : 1 688 901 019

 Opening
 pressure, bar : 207...210

 Orifice plate
 diameter mm : 0,8

 Test lines : 1 680 750 067

 Outside diameter
 x Wall thickness
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm	:	4.40...4.50
	:	(4.35...4.55)
Rack travel in mm	:	19.50...21.00
Firing order	:	8- 7- 2- 6- 3- 5- 4- 1

Phasing	:	0-45-90-135-180-225- 270-315
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Tolerance + - °	:	0.50 (0.75)
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Time to cyl. no.	:	8
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BASIC SETTING

1st speed	rpm	:	1150
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Rack travel in mm	:	14.80...14.90
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Del.quantity cm ³ /	:	31.1...31.3
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100 s:	(30.8...31.6)
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Spread	cm ³	:	0.5
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100 s:	(0.9)
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2nd speed	rpm	:	350.0
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Rack travel in mm	:	5.0...5.6
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Del.quantity cm ³ /	:	1.6...2.2
--------------------------------	---	-----------

100 s:	(1.3...2.5)
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Spread	cm ³	:	0.6
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100 s:	(1.0)
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(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed	rpm	:	350
travel mm	:	1.30...1.80	
2nd speed	rpm	:	454
travel mm	:	3.30...3.80	
3rd speed	rpm	:	960
travel mm	:	5.30...5.80	
4th speed	rpm	:	1206
travel mm	:	7.90...8.40	
5th speed	rpm	:	1380
travel mm	:	11.00...12.00	

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed	rpm	:	1275
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Rack travel in mm	:	15.20...17.80
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FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150
Aneroid pressure h: 2000
Del.quantity : 311.0...313.0
1000 : (308.0...316.0)
Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version

Control lever
position degrees: 113...121

Testing:

1st rack travel in: 13.80
Speed rpm : 1190...1200
2nd rack travel in: 4.00
Speed rpm : 1270...1300
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 62...70

Testing:

Speed rpm : 250
Minimum rack trave: 7.00
Speed rpm : 350
Rack travel in mm : 5.00...5.60

CONSTANT REGULATION

Speed rpm : 350...600

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 7.10...7.30

Measurement

Speed 1/min : 500

1st pressure hPa : 400
Rack travel in m: 8.30...8.40
2nd pressure hPa : 1200
Rack travel in m: 12.50...12.80

START CUT-OUT

Speed 1/min : 310 (330)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 2000
Speed rpm : 750
Del.quantity cm³/ : 303.0...313.0
1000 s: (300.0...316.0)
Spread cm³ : 8.00
1000 s: (12.0)

Aneroid pressure h: 2000
Speed rpm : 1150
Del.quantity cm³/ : 240.0...243.0 *
1000 s: (237.0...246.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 120.0...122.0
1000 s: (117.0...125.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.80
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 320.0...340.0
1000 s: (316.0...344.0)

Remarks:

:

* = Set at reduced-delivery stop.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 12,8 o
 Edition : 15.11.90
 Replaces : -
 Test oil : ISO-4113

Combination no. : 0 402 648 893

Injection pump
 Pump designation : PE8P120A320LS7835
 EP type number : 0 412 628 847
 Governor
 Governor design. : RQ300/950PA971-2
 Governor no. : 0 421 801 548

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : OM402 A

1st version kW : 280.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60
 : (5.45...5.65)
 Rack travel in mm : 20.00...21.00
 Firing order : 8- 7- 2- 6- 3- 5-
 4- 1

Phasing : 0-45-90-135-180-225-
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.60...14.80

Del.quantity cm³/ : 22.1...22.3

100 s: (21.8...22.6)

Spread cm³ : 0.6

100 s: (0.9)

2nd speed rpm : 300.0
 Rack travel in mm : 6.2...6.8
 Del.quantity cm³/ : 1.6...2.2
 100 s: (1.3...2.5)
 Spread cm³ : 0.6
 100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 900

Del.quantity : 221.0...223.0

1000 : (218.0...226.0)

Spread cm³ : 6.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.40

Speed rpm : 990...1005

2nd rack travel in: 4.00

Speed rpm : 1070...1100

4th rack travel in: 1150

Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 6.5

Testing:

Speed rpm : 200

Minimum rack trave: 7.80

Speed rpm : 300

Rack travel in mm : 6.20...6.80

Rack travel in mm : 2.00

Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.50

2nd speed rpm : 950

Rack travel in m: 14.40...14.60

3rd speed rpm : 800

Rack travel in m: 14.90...15.10

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 600

Pressure hPa : 900

Rack travel mm : 14.60...14.80

Measurement

Speed 1/min : 600

1st pressure hPa : 250

Rack travel in m: 9.90...10.10

2nd pressure hPa : 600

Rack travel in m: 13.30...13.50

3rd pressure hPa : 1100

Rack travel in m: 14.70...14.90 *

4th pressure hPa : -

Rack travel in m: 9.10...9.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500

Speed rpm : 950

Del.quantity cm³/ : 222.0...225.0

1000 s: (219.0...228.0)

Spread cm³ : 8.00

1000 s: (12.)

Aneroid pressure h: 1500

Speed rpm : 800

Del.quantity cm³/ : 234.0...238.0

1000 s: (231.0...241.0)

Spread cm³ : 8.00

1000 s: (12.00)

Speed rpm : 500

Del.quantity cm³/ : 122.0...124.0

1000 s: (119.0...127.0)

Spread cm³ : 8.00

1000 s: (12.00)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.40

Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100

Remarks:

:

Adjust full-load delivery by turning temperature-dependent excess-fuel stop for starting (TAS).

* Increase in control-rod travel with respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 12,8 o 1
 Edition : 23.11.90
 Replaces : -
 Test oil : ISO-4113

 Combination no. : 0 402 648 894

 Injection pump
 Pump designation : PE8P120A320LS7835
 EP type number : 0 412 628 847
 Governor
 Governor design. : RQV300...950PA797-18
 Governor no. : 0 421 813 886

 Customer-spec. information
 Customer : MERCEDES-BENZ

 Engine : OM402 A

 1st version kW : 280.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

 Test oil
 inlet temp. °C : 38...42

 Overflow valve : 1 417 413 025

 Inlet press., bar : 1.50

 Overflow
 quantity min. 1/h: 100...120

 Test nozzle holder
 assembly : 1 688 901 019

 Opening
 pressure, bar : 207...210

 Orifice plate
 diameter mm : 0,8

 Test lines : 1 680 750 067

 Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60
 : (5.45...5.65)
 Rack travel in mm : 20.00...21.00
 Firing order : 8-7-2-6-3-5-
 4-1

Phasing : 0-45-90-135-180-225-
 270-315
 Tolerance + - ° : 0.50 (0.75)
 Time to cyl. no. : 8

BASIC SETTING

1st speed	rpm	: 600
Rack travel in mm : 14.60...14.80		
Del.quantity cm ³ /	: 22.1...22.3	
100 s: (21.8...22.6)		
Spread	cm ³	: 0.6
100 s: (0.9)		
2nd speed	rpm	: 300.0
Rack travel in mm	: 6.4...7.0	
Del.quantity cm ³ /	: 1.6...2.2	
100 s: (1.3...2.5)		
Spread	cm ³	: 0.6
100 s: (1.0)		

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL
 1st speed rpm : 300
 travel mm : 1.00...1.50
 2nd speed rpm : 567
 travel mm : 4.40...4.90
 3rd speed rpm : 780
 travel mm : 6.10...6.60
 4th speed rpm : 1009
 travel mm : 8.30...8.80
 5th speed rpm : 1092
 travel mm : 9.80...10.30

GUIDE SLEEVE POSITION
 Control-lever position
 Degree: -1
 Speed rpm : 980
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 600
 Aneroid pressure h: 900
 Del.quantity : 221.0...223.0
 1000 : (218.0...226.0)
 Spread cm³ : 6.00
 1000 : (9.00)

RATED SPEED

1st version
 Control lever
 position degrees: 122...130

Testing:

1st rack travel in: 13.40
 Speed rpm : 990...1000
 2nd rack travel in: 4.00
 Speed rpm : 1070...1100
 4th rack travel in: 1250
 Speed rpm : 0.00...1.50

LOW IDLE 1

Control lever
 position degrees: 80...88

Testing:

Speed rpm : 200
 Minimum rack trave: 8.00
 Speed rpm : 300
 Rack travel in mm : 6.40...7.00

CONSTANT REGULATION

Speed rpm : 250...360

TORQUE CONTROL

Dimension a mm : 0.50
 Torque control curve - 1st version
 1st speed rpm : 950
 Rack travel in m: 14.40...14.60
 2nd speed rpm : 800
 Rack travel in m: 14.90...15.10
 3rd speed rpm : 850
 Rack travel in m: 14.60...14.80

Aneroid/Altitude Compensator Test

1st version
 Setting
 Speed rpm : 600
 Pressure hPa : 900
 Rack travel mm : 14.60...14.80

Measurement
 Speed 1/min : 600

1st pressure hPa : 250

Rack travel in m: 10.00...10.20
 2nd pressure hPa : 600
 Rack travel in m: 13.30...13.50
 3rd pressure hPa : 1100
 Rack travel in m: 14.70...14.90 *
 4th pressure hPa : 1200
 Rack travel in m: 14.90...15.10
 5th pressure hPa : -
 Rack travel in m: 9.10...9.40

START CUT-OUT

Speed 1/min : 240 (260)

FUEL DELIVERY CHARACTERISTICS

1st version
 Aneroid pressure h: 1500
 Speed rpm : 950
 Del.quantity cm³/ : 222.0...225.0
 1000 s: (219.0...228.0)
 Spread cm³ : 8.00
 1000 s: (12.0)
 Aneroid pressure h: 1500
 Speed rpm : 800
 Del.quantity cm³/ : 234.0...238.0
 1000 s: (231.0...241.0)
 Spread cm³ : 8.00
 1000 s: (12.0)
 Aneroid pressure h: -
 Speed rpm : 500
 Del.quantity cm³/ : 122.0...124.0
 1000 s: (119.0...127.0)
 Spread cm³ : 8.00
 1000 s: (12.0)

BREAKAWAY

1st version
 1mm rack travel less than
 full load rack tr: 13.40
 Speed rpm : 990...1000

STARTING FUEL DELIVERY

Speed rpm : 100
 Del.quantity cm³/ : 210.0...230.0
 1000 s: (206.0...234.0)

Remarks:

:

* Increase in control-rod travel with
 respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM 21,6 c
 Edition : 16.11.90
 Replaces : -
 Test oil : ISO-4113

Combination no. : 0 402 670 808

Injection pump
 Pump designation : PE12P120A520/5RS7212
 EP type number : 0 412 620 823
 Governor
 Governor design. : RSUV325...1150POA359
 Governor no. : 0 421 829 108

Customer-spec. information
 Customer : MWM

Engine : TBD234V12

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.60...4.70
 : (4.55...4.75)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 2- 9- 10- 5- 6-
 11- 12- 3- 4- 7- 8

Phasing : 0-30-60-90-120-150-
 180-210-240-270-300-
 330

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 13.40...13.50

Del.quantity cm3/ : 26.0...26.2

100 s: (25.8...26.6)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0
 Rack travel in mm : 6.9...7.1
 Del.quantity cm3/ : 3.0...4.0
 100 s: (2.7...4.3)
 Spread cm3 : 0.6
 100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.00

RATED SPEED

1st version

Control lever

position degrees: 106...114

Testing:

1st rack travel in: 12.40
 Speed rpm : 1190...1200
 2nd rack travel in: 4.00
 Speed rpm : 1260...1290
 4th rack travel in: 1440
 Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever

position degrees: 71...79

Setting point w/out bumper spring
 Speed rpm : 325
 Rack travel in mm : 6.5

Testing:
Speed rpm : 100
Minimum rack trave: 19.50
Speed rpm : 325
Rack travel in mm : 6.90...7.10
Rack travel in mm : 2.00
Speed rpm : 440...500

Latching at 0.75 bar...0.85 bar.
Unlatching at 0.35 bar...0.45 bar.
Full-load delivery not known. Set according to engine test report.

Aneroid/Altitude Compensator Test

Test specifications upon request.

1st version

Setting
Speed rpm : 500
Pressure hPa : 1250
Rack travel mm : 13.40...13.50

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.30...9.50
2nd pressure hPa : 625
Rack travel in m: 12.00...12.10

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 12.40
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 330.0...370.0
1000 s: (-)

LOW IDLE

Speed rpm : 325
Rack travel in mm : 6.90...7.10
Del.quantity cm³/ : 30.0...40.0
1000 s: (27.0...43.0)
Spread cm³ : 6.00
1000 s: (10.00)

Remarks:

:

* = Element disconnected at idle for cylinders 2, 4, 6, 8, 10 and 12.

Hydraulic latching of starting delivery.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 t
 Edition : 17.10.90
 Replaces : 16.8.90
 Test oil : ISO-4113

Combination no. : 0 402 736 805

Injection pump
 Pump designation : PES6P120A120RS7206
 EP type number : 0 412 726 835
 Governor
 Governor design. : RQV350..1100PA924-5K
 Governor no. : 0 421 815 250

Customer-spec. information

Customer : CUMMINS

Engine : 6CTAA

1st version kW : 202.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 17...19

Prestroke mm : 3.50...3.60
 : (3.45...3.65)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.10...12.20

Del.quantity cm³/

100 s: (15.5...16.3)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.2...5.4

Del.quantity cm³/

100 s: (2.1...3.1)

Spread cm³ : 0.7

100 s: (1.1)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed	rpm	: 350
travel mm		: 1.10...1.50
2nd speed	rpm	: 550
travel mm		: 3.40...4.00
3rd speed	rpm	: 900
travel mm		: 6.10...6.70
4th speed	rpm	: 1150
travel mm		: 8.40...8.60
5th speed	rpm	: 1250
travel mm		: 9.40...9.80

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1420

Rack travel in mm : 6.00...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 158.0...160.0
1000 : (155.0...163.0)
Spread cm³ : 5.00
1000 : (9.00)

RATE) SPEED

1st version
Control lever
position degrees: 111...119

Testing:

1st rack travel in: 11.10
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1260...1290
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 71...79

Testing:

Speed rpm : 250
Minimum rack trave: 6.80
Speed rpm : 350
Rack travel in mm : 5.20...5.40

CONSTANT REGULATION

Speed rpm : 350...550

TORQUE CONTROL

Dimension a mm : 1.00
Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 12.10...12.20
2nd speed rpm : 600
Rack travel in m: 11.10...11.30
3rd speed rpm : 800
Rack travel in m: 11.70...11.90

Aneroid/Altitude Compensator Test

1st version
Setting
Speed rpm : 1100
Pressure hPa : 1200
Rack travel mm : 12.10...12.20

Measurement
Speed 1/min : 1100

1st pressure hPa : -
Rack travel in m: 8.10...8.30
2nd pressure hPa : 600
Rack travel in m: 11.10...11.30
3rd pressure hPa : 300

Rack travel in m: 8.70...9.10

START CUT-OUT

Speed 1/min : 270 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 600
Del.quantity cm³/ s: 174.0...180.0
1000 s: (171.0...183.0)
Spread cm³ : 8.00
1000 s: (12.)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ s: 105.0...109.0
1000 s: (103.0...111.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.10
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ s: 235.0...255.0
1000 s: (231.0...259.0)

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.20...5.40
Del.quantity cm³/ s: 23.0...29.0
1000 s: (21.0...31.0)
Spread cm³ : 7.00
1000 s: (11.00)

Remarks:

: C.D.C. # 321182
Start-of delivery mark/lock = 7.5°
angular displacement of the cam after
start of delivery of cylinder 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 5,9 W
 Edition : 15.11.90
 Replaces : 8.8.90
 Test oil : ISO-4113

Combination no. : 0 402 736 806

Injection pump
 Pump designation : PES6P110A120RS7213
 EP type number : 0 412 716 804
 Governor
 Governor design. : RQV400...1250PA964K
 Governor no. : 0 421 815 252

Customer-spec. information

Customer : C.D.C.

Engine : 6BTA-A

1st version kW : 171.5
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 115...125

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45
 : (4.30...4.50)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 15.50...15.60

Del.quantity cm³/ : 16.5...16.7

100 s: (16.2...17.0)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 400.0
 Rack travel in mm : 5.5...5.7
 Del.quantity cm³/ : 3.2...3.8
 100 s: (3.0...4.0)
 Spread cm³ : 0.8
 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed	rpm	: 325
	travel mm	: 0.70...1.10
2nd speed	rpm	: 400
	travel mm	: 1.40...1.60
3rd speed	rpm	: 600
	travel mm	: 2.90...3.30
4th speed	rpm	: 1300
	travel mm	: 7.20...7.40
5th speed	rpm	: 1500
	travel mm	: 9.10...9.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed	rpm	: 1250
Aneroid pressure h:	1200	
Del.quantity	: 165.5...167.5	
1000	: (162.5...170.5)	

Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 57...65

Testing:

1st rack travel in: 14.50
Speed rpm : 1295...1305
2nd rack travel in: 4.00
Speed rpm : 1470...1500
4th rack travel in: 1600
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 13...21

Testing:

Speed rpm : 275
Minimum rack trave: 7.20
Speed rpm : 400
Rack travel in mm : 5.50...5.70

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 1250
Rack travel in m: 15.50...15.60
2nd speed rpm : 800
Rack travel in m: 14.40...14.60
3rd speed rpm : 700
Rack travel in m: 13.90...14.30

Aneroid/Altitude Compensator Test

1st version
Setting
Speed rpm : 1250
Pressure hPa : 1200
Rack travel mm : 15.50...15.60

Measurement
Speed 1/min : 1250

1st pressure hPa : -
Rack travel in m: 7.70...8.10
2nd pressure hPa : 400
Rack travel in m: 9.70...9.80
3rd pressure hPa : 800
Rack travel in m: 13.30...13.70

START CUT-OUT

Speed 1/min : 295 (305)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 800
Del.quantity cm³/ : 176.0...182.0
1000 s: (173.0...185.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 82.5...86.5
1000 s: (80.5...88.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 14.50
Speed rpm : 1295...1305

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 155.0...175.0
1000 s: (150.0...180.0)
Rack travel in mm : 12.00...13.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 5.50...5.70
Del.quantity cm³/ : 32.0...38.0
1000 s: (30.0...40.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

: C.D.C # 3913440
Start-of-delivery mark 6° cam angle
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 r
 Edition : 15.11.90
 Replaces : 8.11.90
 Test oil : ISO-4113

Combination no. : 0 402 736 807

Injection pump
 Pump designation : PES6P110A120RS7214
 EP type number : 0 412 716 805
 Governor
 Governor design. : RQV350...1100PA964-1
 K
 Governor no. : 0 421 815 253

Customer-spec. information

Customer : C.D.C.

Engine : 6CTA-A

1st version kW : 201.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 115...125

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45
 : (4.30...4.50)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 15.70...15.80

Del.quantity cm³/ : 20.6...20.8

100 s: (20.3...21.1)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.7...5.9

Del.quantity cm³/ : 2.7...3.3

100 s: (2.5...3.5)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

travel mm : 1.80...2.00

2nd speed rpm : 450

travel mm : 3.10...3.50

3rd speed rpm : 600

travel mm : 5.10...5.50

4th speed rpm : 1000

travel mm : 8.10...8.30

5th speed rpm : 1200

travel mm : 9.60...10.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 1500

Del.quantity : 206.0...208.0

1000 : (203.0...211.0)

Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version

Control lever
position degrees: 64...72

Testing:

1st rack travel in: 14.40
Speed rpm : 1145...1155
2nd rack travel in: 4.00
Speed rpm : 1300...1330
4th rack travel in: 14.00
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 11...19

Testing:

Speed rpm : 275
Minimum rack trave: 7.20
Speed rpm : 350
Rack travel in mm : 5.70...5.90

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 1050
Rack travel in m: 15.70...15.80
2nd speed rpm : 650
Rack travel in m: 13.70...14.10
3rd speed rpm : 1100
Rack travel in m: 15.40...15.60

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 1050
Pressure hPa : 1500
Rack travel mm : 15.70...15.80

Measurement

Speed 1/min : 1050

1st pressure hPa : -
Rack travel in m: 8.40...8.80
2nd pressure hPa : 340
Rack travel in m: 10.20...10.30
3rd pressure hPa : 840
Rack travel in m: 13.60...14.00

START CUT-OUT

Speed 1/min : 275 (285)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500
Speed rpm : 650
Del.quantity cm³/ : 197.5...203.5
1000 s: (194.5...206.5)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 98.0...102.0
1000 s: (96.0...104.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 14.40
Speed rpm : 1145...1155

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 160.0...180.0
1000 s: (155.0...185.0)
Rack travel in mm : 11.40...12.40

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.70...5.90
Del.quantity cm³/ : 27.0...33.0
1000 s: (25.0...35.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks: : C.D.C. # 3916627

Start-of-delivery mark = 5.5° after
start of delivery cyl. 1.

Bow dimension:
Sliding-sleeve position = 37.0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 5,9 w 1
 Edition : 15.11.90
 Replaces : 8.11.90
 Test oil : ISO-4113

 Combination no. : 0 402 736 810

 Injection pump
 Pump designation : PES6P110A120RS7213
 EP type number : 0 412 716 804
 Governor
 Governor design. : RQV400...1250PA964-2
 Governer no. : 0 421 815 254

 Customer-spec. information
 Customer : C.D.C.

 Engine : 6BTA-A

 1st version kW : 141.0
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

 Overflow valve : 1 417 413 047

 Inlet press., bar : 1.50

 Overflow
 quantity min. 1/h: 115...125

 Test nozzle holder
 assembly : 1 688 901 101

 Opening
 pressure, bar : 207...210

 Orifice plate
 diameter mm : 0,6

 Test lines : 1 680 750 008

 Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45
 : (4.30...4.50)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - * : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 14.80...14.90

Del.quantity cm³/ : 15.9...16.1

100 s: (15.6...16.4)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 400.0

Rack travel in mm : 5.4...5.6

Del.quantity cm³/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed	rpm	: 325
travel mm		: 0.70...1.10
2nd speed	rpm	: 400
travel mm		: 1.40...1.60
3rd speed	rpm	: 600
travel mm		: 2.90...3.30
4th speed	rpm	: 1300
travel mm		: 7.20...7.40
5th speed	rpm	: 1500
travel mm		: 9.10...9.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed	rpm	: 1250
Aneroid pressure h:		: 1200
Del.quantity		: 159.0...161.0
1000		: (156.0...164.0)

Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 57...65

Testing:

1st rack travel in: 13.80
Speed rpm : 1295...1305
2nd rack travel in: 4.00
Speed rpm : 1455...1485
4th rack travel in: 1600
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 11...19

Testing:

Speed rpm : 275
Minimum rack trave: 7.20
Speed rpm : 400
Rack travel in mm : 5.40...5.60

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 1250
Rack travel in m: 14.80...14.90
2nd speed rpm : 800
Rack travel in m: 13.00...13.20

Aneroid/Altitude Compensator Test

1st version
Setting
Speed rpm : 1250
Pressure hPa : 1200
Rack travel mm : 14.80...14.90

Measurement
Speed 1/min : 1250

1st pressure hPa : -
Rack travel in m: 8.20...8.60
2nd pressure hPa : 415
Rack travel in m: 10.20...10.30
3rd pressure hPa : 740
Rack travel in m: 13.00...13.40

START CUT-OUT

Speed 1/min : 290 (300)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 800
Del.quantity cm³/ s : 158.0...164.0
1000 s: (155.0...167.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ s : 95.5...99.5
1000 s: (93.5...101.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 13.80
Speed rpm : 1295...1305

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ s : 155.0...175.0
1000 s: (150.0...180.0)
Rack travel in mm : 12.00...13.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 5.40...5.60
Del.quantity cm³/ s : 32.0...38.0
1000 s: (30.0...40.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks: : C.D.C. # 3919090

Start-of-delivery mark = 5.5° after
start of delivery cyl. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 r 3
 Edition : 15.11.90
 Replaces : -
 Test oil : ISO-4113

 Combination no. : 0 402 736 812

 Injection pump
 Pump designation : PES6P110A120RS7214
 EP type number : 0 412 716 805
 Governor
 Governor design. : RQV350...1100PA964-4
 K
 Governor no. : 0 421 815 256

 Customer-spec. information
 Customer : C.D.C.

 Engine : 6CTA-A

 1st version kW : 156.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

 Test oil
 inlet temp. °C : 38...42

 Overflow valve : 1 417 413 047

 Inlet press., bar : 1.50

 Overflow
 quantity min. 1/h: 115...125

 Test nozzle holder
 assembly : 1 688 901 101

 Opening
 pressure, bar : 207...210

 Orifice plate
 diameter mm : 0,6

 Test Lines : 1 680 750 008

 Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45
 : (4.30...4.50)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 12.60...12.70

Del.quantity cm³/ : 14.7...14.9

100 s: (14.4...15.2)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.6...5.8

Del.quantity cm³/ : 2.7...3.3

100 s: (2.5...3.5)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed	rpm	: 350
travel mm		: 1.80...2.00
2nd speed	rpm	: 450
travel mm		: 3.10...3.50
3rd speed	rpm	: 700
travel mm		: 5.90...6.30
4th speed	rpm	: 1200
travel mm		: 9.00...9.20
5th speed	rpm	: 1400
travel mm		: 10.70...11.10

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed	rpm	: 1200
Aneroid pressure h:		: 1200
Del.quantity		: 147.5...149.5
1000		: (144.5...152.5)

Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 60...68

Testing:
1st rack travel in: 11.60
Speed rpm : 1245...1255
2nd rack travel in: 4.00
Speed rpm : 1375...1405
4th rack travel in: 1500
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 11...19

Testing:
Speed rpm : 275
Minimum rack trave: 7.20
Speed rpm : 350
Rack travel in mm : 5.60...5.80

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 1200
Rack travel in m: 12.60...12.70
2nd speed rpm : 650
Rack travel in m: 11.20...11.60

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 1200
Pressure hPa : 1200
Rack travel mm : 12.60...12.70

Measurement
Speed 1/min : 1200

1st pressure hPa : -
Rack travel in m: 8.00...8.40
2nd pressure hPa : 225
Rack travel in m: 9.20...9.30
3rd pressure hPa : 515
Rack travel in m: 11.20...11.60

START CUT-OUT

Speed 1/min : 265 (270)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 650
Del.quantity cm³/ s : 152.5...158.5
1000 s: (149.5...161.5)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ s : 90.0...94.0
1000 s: (88.0...96.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.60
Speed rpm : 1245...1255

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ s : 145.0...165.0
1000 s: (140.0...170.0)
Rack travel in mm : 11.00...12.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.60...5.80
Del.quantity cm³/ s : 27.0...33.0
1000 s: (25.0...35.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks: : C.D.C. # 3917088

Start-of-delivery mark = 5.5° after
start of delivery cyl. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 r 4
 Edition : 15.11.90
 Replaces : -
 Test oil : ISO-4113

 Combination no. : 0 402 736 813

 Injection pump
 Pump designation : PES6P110A120RS7214
 EP type number : 0 412 716 805
 Governor
 Governor design. : RQV350...1100PA964-5
 K
 Governor no. : 0 421 815 257

 Customer-spec. information
 Customer : C.D.C.

 Engine : 6CTA-A

 1st version kW : 187.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

 Test oil
 inlet temp. °C : 38...42

 Overflow valve : 1 417 413 047

 Inlet press., bar : 1.50

 Overflow
 quantity min. 1/h: 115...125

 Test nozzle holder
 assembly : 1 688 901 101

 Opening
 pressure, bar : 207...210

 Orifice plate
 diameter mm : 0,6

 Test lines : 1 680 750 008

 Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

 (A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45
 : (4.30...4.50)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 14.50...14.60

Del.quantity cm³/ : 18.6...18.8

100 s: (18.3...19.1)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.7...5.9

Del.quantity cm³/ : 2.7...3.3

100 s: (2.5...3.5)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed	rpm	:	350
	travel mm	:	1.80...2.00
2nd speed	rpm	:	450
	travel mm	:	3.10...3.50
3rd speed	rpm	:	600
	travel mm	:	5.10...5.50
4th speed	rpm	:	1000
	travel mm	:	8.10...8.30
5th speed	rpm	:	1200
	travel mm	:	9.60...10.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed	rpm	:	1100
Aneroid pressure h:	1200		
Del.quantity		:	186.5...188.5
1000		:	(183.5...191.5)

Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 62...70

Testing:

1st rack travel in: 13.50
Speed rpm : 1145...1155
2nd rack travel in: 4.00
Speed rpm : 1290...1320
4th rack travel in: 1400
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 11...19

Testing:

Speed rpm : 275
Minimum rack trave: 7.20
Speed rpm : 350
Rack travel in mm : 5.70...5.90

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 14.50...14.60
2nd speed rpm : 650
Rack travel in m: 13.50...13.70
3rd speed rpm : 500
Rack travel in m: 12.70...13.10

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 1100
Pressure hPa : 1200
Rack travel mm : 14.50...14.60

Measurement

Speed 1/min : 1100

1st pressure hPa : -
Rack travel in m: 8.40...8.80
2nd pressure hPa : 285
Rack travel in m: 9.70...9.80
3rd pressure hPa : 700
Rack travel in m: 12.70...13.10

START CUT-OUT

Speed 1/min : 260 (270)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 650
Del.quantity cm³/ 1000 s: 198.0...204.0
 1000 s: (195.0...207.0)
Spread cm³ : 8.00
 1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ 1000 s: 98.0...102.0
 1000 s: (96.0...104.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 13.50
Speed rpm : 1145...1155

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ 1000 s: 145.0...165.0
 1000 s: (140.0...170.0)
Rack travel in mm : 10.80...11.80

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.70...5.90
Del.quantity cm³/ 1000 s: 27.0...33.0
 1000 s: (25.0...35.0)
Spread cm³ : 8.00
 1000 s: (12.00)

Remarks: : C.D.C. # 3916628

Start-of-delivery mark = 5.5° after
start of delivery cyl. 1.

Bow dimension:
Sliding-sleeve position = 37.0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 r 1
 Edition : 15.11.90
 Replaces : 8.11.90
 Test oil : ISO-4113

Combination no. : 0 402 736 814

Injection pump
 Pump designation : PES6P110A120RS7214
 EP type number : 0 412 716 805
 Governor
 Governor design. : RQV350...1200PA964-6
 K
 Governor no. : 0 421 815 258

Customer-spec. information
 Customer : C.D.C.

Engine : 6CTA-A

1st version kW : 187.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 115...125

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45
 : (4.30...4.50)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 14.50...14.60

Del.quantity cm³/ : 18.3...18.5

100 s: (18.0...18.8)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.6...5.8

Del.quantity cm³/ : 2.7...3.3

100 s: (2.5...3.5)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

travel mm : 1.80...2.00

2nd speed rpm : 450

travel mm : 3.10...3.50

3rd speed rpm : 700

travel mm : 5.90...6.30

4th speed rpm : 1200

travel mm : 9.00...9.20

5th speed rpm : 1400

travel mm : 10.70...11.10

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 1200

Del.quantity : 183.0...185.0

1000 : (180.0...188.0)

Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 62...70

Testing:
1st rack travel in: 13.50
Speed rpm : 1245...1255
2nd rack travel in: 4.00
Speed rpm : 1405...1435
4th rack travel in: 1500
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 11...19

Testing:
Speed rpm : 275
Minimum rack trave: 7.20
Speed rpm : 350
Rack travel in mm : 5.60...5.80

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 1200
Rack travel in m: 14.50...14.60
2nd speed rpm : 650
Rack trr. ol in m: 11.60...12.00

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 1200
Pressure hPa : 1200
Rack travel mm : 14.50...14.60

Measurement
Speed 1/min : 1200
1st pressure hPa : -
Rack travel in m: 7.70...8.10
2nd pressure hPa : 270
Rack travel in m: 9.50...9.60
3rd pressure hPa : 700
Rack travel in m: 12.60...13.00

START CUT-OUT

Speed 1/min : 265 (270)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 650
Del.quantity cm³/ 1000 s: 167.5...173.5
1000 s: (164.5...176.5)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ 1000 s: 90.0...94.0
1000 s: (88.0...96.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 13.50
Speed rpm : 1245...1255

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ 1000 s: 140.0...160.0
1000 s: (135.0...165.0)
Rack travel in mm : 10.70...11.70

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.60...5.80
Del.quantity cm³/ 1000 s: 27.0...33.0
1000 s: (25.0...35.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks: : C.D.C. # 3917089

Start-of-delivery mark = 5.5° after
start of delivery cyl. 1.

Bow dimension:
Sliding-sleeve position = 37.0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 r 5
 Edition : 15.11.90
 Replaces : -
 Test oil : ISO-4113

Combination no. : 0 402 736 815

Injection pump
 Pump designation : PES6P110A120RS7214
 EP type number : 0 412 716 805
 Governor
 Governor design. : RQV350...1000PA964-7
 K
 Governor no. : 0 421 815 259

Customer-spec. information
 Customer : C.D.C.

Engine : 6CTA-A

1st version kW : 194.0
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 115...125

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45
 : (4.30...4.50)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 15.80...15.90

Del.quantity cm³/ : 21.7...21.9

100 s: (21.4...22.2)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.6...5.8

Del.quantity cm³/ : 2.7...3.3

100 s: (2.5...3.5)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

travel mm : 1.60...1.80

2nd speed rpm : 450

travel mm : 3.00...3.40

3rd speed rpm : 600

travel mm : 5.20...5.60

4th speed rpm : 1000

travel mm : 8.70...8.90

5th speed rpm : 1150

travel mm : 10.10...10.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 1500

Del.quantity : 217.0...219.0

1000 : (214.0...222.0)

Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 62...70

Testing:
 1st rack travel in: 14.30
 Speed rpm : 1050...1060
 2nd rack travel in: 4.00
 Speed rpm : 1205...1235
 4th rack travel in: 1300
 Speed rpm : 0.00...1.00

LOW IDLE 1
Control Lever
position degrees: 11...19

Testing:
 Speed rpm : 275
 Minimum rack travel: 7.20
 Speed rpm : 350
 Rack travel in mm : 5.60...5.80

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?
 Torque control curve - 1st version
 1st speed rpm : 900
 Rack travel in m: 15.80...15.90
 2nd speed rpm : 650
 Rack travel in m: 14.00...14.40
 3rd speed rpm : 1000
 Rack travel in m: 15.30...15.50

Aneroid/Altitude Compensator Test

1st version
Setting
Speed rpm : 900
Pressure hPa : 1500
Back travel mm : 15.80...15.90

Measurement Speed 1/min : 900

1st pressure hPa : -
 Rack travel in m: 8.40...8.80
 2nd pressure hPa : 340
 Rack travel in m: 10.20...10.30
 3rd pressure hPa : 840
 Rack travel in m: 13.60...14.00

START CUT-OUT

Speed 1/min : 290 (300)

FUEL DELIVERY CHARACTERISTICS

1st version
 Aneroid pressure h: 1500
 Speed rpm : 650
 Del.quantity cm³/ : 211.0...217.0
 1000 s: (208.0...220.0)
 Spread cm³ : 8.00
 1000 s: (12.0)
 Aneroid pressure h: -
 Speed rpm : 500
 Del.quantity cm³/ : 98.0...102.0
 1000 s: (96.0...104.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 14.30
Speed nm : 1050...1060

STARTING FUEL DELIVERY

Speed rpm : 100
 Del.quantity cm³/ 1000 s: 150.0...170.0
 1000 s: (145.0...175.0)
 Rack travel in mm : 10.90...11.90

LOW IDLE

Speed rpm : 350
 Rack travel in mm : 5.60...5.80
 Del.quantity cm³/ 1000 s: 27.0...33.0
 Spread cm³: 8.00
 1000 s: (12.00)

Remarks: : C.D.C. # 3916629

Start-of-delivery mark = 5.5° after start of delivery cyl. 1.

Bow dimension:
Sliding-sleeve position = 37.0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 r 2
 Edition : 15.11.90
 Replaces : 8.11.90
 Test oil : ISO-4113

Combination no. : 0 402 736 816

Injection pump
 Pump designation : PES6P110A120RS7214
 EP type number : 0 412 716 805
 Governor
 Governor design. : RQV350...1200PA964-8
 Governor no. : 0 421 815 264

Customer-spec. information
 Customer : C.D.C.

Engine : 6CTA-A

1st version kW : 213.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 047

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 115...125

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45
 : (4.30...4.50)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 14.70...14.80

Del.quantity cm³/ : 19.0...19.2

100 s: (18.7...19.5)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.6...5.8

Del.quantity cm³/ : 2.7...3.3

100 s: (2.5...3.5)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

travel mm : 1.80...2.00

2nd speed rpm : 450

travel mm : 3.10...3.50

3rd speed rpm : 700

travel mm : 5.90...6.30

4th speed rpm : 1200

travel mm : 9.00...9.20

5th speed rpm : 1400

travel mm : 10.70...11.10

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 190.0...192.0

1000 : (187.0...195.0)

Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 62...70

Testing:

1st rack travel in: 13.20
Speed rpm : 1245...1255
2nd rack travel in: 4.00
Speed rpm : 1400...1430
4th rack travel in: 1500
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 11...19

Testing:

Speed rpm : 275
Minimum rack trave: 7.20
Speed rpm : 350
Rack travel in mm : 5.60...5.80

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 14.70...14.80
2nd speed rpm : 650
Rack travel in m: 12.50...12.90
3rd speed rpm : 1200
Rack travel in m: 14.20...14.40

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 1100
Pressure hPa : 1200
Rack travel mm : 14.70...14.80

Measurement

Speed 1/min : 1100

1st pressure hPa : -
Rack travel in m: 7.70...8.10
2nd pressure hPa : 260
Rack travel in m: 9.60...9.70
3rd pressure hPa : 710
Rack travel in m: 12.80...13.20

START CUT-OUT

Speed 1/min : 265 (270)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 650
Del.quantity cm³/ : 181.0...187.0
1000 s: (178.0...190.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 90.0...94.0
1000 s: (88.0...96.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 13.20
Speed rpm : 1245...1255

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 140.0...160.0
1000 s: (135.0...165.0)
Rack travel in mm : 10.70...11.70

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.60...5.80
Del.quantity cm³/ : 27.0...33.0
1000 s: (25.0...35.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks: : C.D.C. # 3916626

Start-of-delivery mark = 5.5° after
start of delivery cyl. 1.

Bow dimension:
Sliding-sleeve position = 37.0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,7 f
 Edition : 19.10.90
 Replaces : 8.6.88
 Test oil : ISO-4113

Combination no. : 0 402 746 808

Injection pump
 Pump designation : PES6P120A720LS7107
 EP type number : 0 412 726 801
 Governor
 Governor design. : RQ300/1100PA805
 Governer no. : 0 421 801 352

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM447ha

1st version kW : 206.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 9.00...12.00
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.40...13.50

Del.quantity cm³/ : 19.7...19.9

100 s: (19.4...20.2)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.8...6.2

Del.quantity cm³/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm³ : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 650

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 750

Del.quantity : 197.0...199.0

1000 : (194.0...202.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 650

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.40
Speed rpm : 1145...1160
2nd rack travel in: 4.00
Speed rpm : 1220...1250
4th rack travel in: 1350
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.9

Testing:

Speed rpm : 100
Minimum rack trave: 7.50
Speed rpm : 300
Rack travel in mm : 5.80...6.00
Rack travel in mm : 2.00
Speed rpm : 380...420

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 11.40...11.70

Measurement

Speed 1/min : 500

1st pressure hPa : 230
Rack travel in m: 11.70...11.90
2nd pressure hPa : 370
Rack travel in m: 13.10...13.30

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 750
Speed rpm : 600
Del.quantity cm3/ : 193.0...196.0
1000 s: (190.0...199.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 149.0...151.0
1000 s: (146.0...154.0)
Spread cm3 : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 12.40
Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 150.0...170.0
1000 s: (146.0...174.0)

Remarks:

:
Adjust full-load delivery by turning
temperature-dependent excess-fuel stop
for starting (TAS).

APPLICATION

Omnibus

RATED SPEED

1st version

Control lever

position degrees: 58...66

Testing:

1st rack travel in: 14.80

Speed rpm : 940...970

2nd rack travel in: 4.00

Speed rpm : 1115...1125

4th rack travel in: 1200

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 7...15

Testing:

Speed rpm : 275

Minimum rack trave: 6.30

Speed rpm : 325

Rack travel in mm : 5.10...5.30

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 900

Rack travel in m: 15.80...15.90

2nd speed rpm : 625

Rack travel in m: 15.20...15.40

3rd speed rpm : 700

Rack travel in m: 15.40...15.60

4th speed rpm : 500

Rack travel in m: 0.00...13.50

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 900

Pressure hPa : 1200

Rack travel mm : 15.80...15.90

Measurement

Speed 1/min : 900

1st pressure hPa : -

Rack travel in m: 8.50...8.90

2nd pressure hPa : 325

Rack travel in m: 10.20...10.30

3rd pressure hPa : 790

Rack travel in m: 13.80...14.20

START CUT-OUT

K21

Speed 1/min : 275 (285)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 625

Del.quantity cm³/ : 302.5...308.5

1000 s: (299.5...311.5)

Spread cm³ : 8.00

1000 s: (12.0)

Speed rpm : 850

Del.quantity cm³/ : 159.0...161.0 *

1000 s: (136.5...157.0)

Aneroid pressure h: -

Speed rpm : 400

Del.quantity cm³/ : 157.5...161.5

1000 s: (155.5...163.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 14.80

Speed rpm : 940...970

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm³/ : 190.0...230.0

1000 s: (180.0...240.0)

Rack travel in mm : 10.80...11.40

LOW IDLE

Speed rpm : 325

Rack travel in mm : 5.10...5.30

Del.quantity cm³/ : 40.0...46.0

1000 s: (38.0...48.0)

Spread cm³ : 8.00

1000 s: (12.00)

Remarks:

: MACK # 3136C5185-P6

Bow dimension:

Sliding-sleeve position = 37.0 mm

* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 a4
 Edition : 15.11.90
 Replaces : 4.9.90
 Test oil : ISO-4113
 Combination no. : 0 402 746 853
 Injection pump
 Pump designation : PES6P120A720RS7157
 EP type number : 0 412 726 814
 Governor
 Governor design. : RQV325...900PA909-1K
 Governer no. : 0 421 815 211
 Customer-spec. information
 Customer : MACK TRUCKS
 Engine : E7-350
 1st version kW : 261.0
 Rated speed : 1800
TEST BENCH REQUIREMENTS
 Test oil
 inlet temp. °C : 38...42
 Overflow valve : 2 417 413 011
 Overflow
 quantity min. 1/h: 160...170
 Test nozzle holder
 assembly : 1 688 901 101
 Opening
 pressure, bar : 207...210
 Orifice plate
 diameter mm : 0,6
 Test lines : 1 680 750 008
 Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600
(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____
BEGINNING OF DELIVERY
 Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.60...13.70

Del.quantity cm³/ : 23.1...23.3

100 s: (22.9...23.5)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.7...4.9

Del.quantity cm³/ : 4.0...4.6

100 s: (3.8...4.8)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed	rpm	: 325
travel mm		: 1.20...1.40
2nd speed	rpm	: 450
travel mm		: 2.80...3.20
3rd speed	rpm	: 650
travel mm		: 5.60...5.80
4th speed	rpm	: 900
travel mm		: 8.30...8.50
5th speed	rpm	: 1100
travel mm		: 10.30...10.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed	rpm	: 900
Aneroid pressure h:		1200
Del.quantity		: 231.5...233.5
1000		: (229.5...235.5)
Spread	cm ³	: 5.00
1000		: (9.00)

RATED SPEED

1st version

Control lever
position degrees: 58...66

Testing:

1st rack travel in: 12.60
Speed rpm : 940...970
2nd rack travel in: 4.00
Speed rpm : 1090...1100
4th rack travel in: 1200
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 7...15

Testing:

Speed rpm : 275
Minimum rack trave: 5.90
Speed rpm : 325
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 900
Rack travel in m: 13.60...13.70
2nd speed rpm : 625
Rack travel in m: 13.30...13.50
3rd speed rpm : 500
Rack travel in m: 0.00...12.00

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 900
Pressure hPa : 1200
Rack travel mm : 13.60...13.70

Measurement

Speed 1/min : 900

1st pressure hPa : -
Rack travel in m: 8.00...8.40
2nd pressure hPa : 325
Rack travel in m: 9.40...9.50
3rd pressure hPa : 685
Rack travel in m: 12.10...12.50

START CUT-OUT

Speed 1/min : 275 (285)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 625
Del.quantity cm³/ : 263.0...269.0
1000 s: (260.0...272.0)
Spread cm³ : 8.00
1000 s: (12.0)
Speed rpm : 850
Del.quantity cm³/ : 159.0...161.0 *
1000 s: (136.5...157.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 153.0...157.0
1000 s: (151.0...159.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 12.60
Speed rpm : 940...970

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 175.0...215.0
1000 s: (165.0...225.0)
Rack travel in mm : 9.00...11.00

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.70...4.90
Del.quantity cm³/ : 40.0...46.0
1000 s: (38.0...48.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks: : MACK # 313GC5185-P2

Bow dimension:

Sliding-sleeve position = 37.0 mm
Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

* This test specification applies only
to the engine/nozzle-and-holder
assemblies on an injection-pump test
bench: setting for test equipment,
check value for engine equipment.

Bow dimension:
Sliding-sleeve position = 37.0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12.0 h3
 Edition : 15.11.90
 Replaces : 5.10.90
 Test oil : ISO-4113

Combination no. : 0 402 746 887

Injection pump
 Pump designation : PES6P120A720RS7200
 EP type number : 0 412 726 833
 Governor
 Governor design. : RQV325...975PA944-2K
 Governor no. : 0 421 815 237

Customer-spec. information
 Customer : MACK TRUCKS

Engine : E7-300A

1st version kW : 224.0
 Rated speed : 1950

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 22...24

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 11.00...13.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 975

Rack travel in mm : 13.00...13.10

Del.quantity cm³/

100 s: (22.2...23.0)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.8...5.0

Del.quantity cm³/

100 s: (3.8...4.8)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.40...1.60

2nd speed rpm : 450

travel mm : 2.80...3.20

3rd speed rpm : 950

travel mm : 7.90...8.10

4th speed rpm : 1200

travel mm : 10.20...10.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 975

Aneroid pressure h: 1200

Del.quantity : 225.0...227.0

1000 : (222.0...230.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 57...65

Testing:

1st rack travel in: 12.00
Speed rpm : 1015...1045
2nd rack travel in: 4.00
Speed rpm : 1180...1190
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 8...16

Testing:

Speed rpm : 275
Minimum rack trave: 6.00
Speed rpm : 325
Rack travel in mm : 4.80...5.00

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 975
Rack travel in m: 13.00...13.10
2nd speed rpm : 600
Rack travel in m: 12.10...12.30
3rd speed rpm : 500
Rack travel in m: 11.30...11.70

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 975
Pressure hPa : 1200
Rack travel mm : 13.00...13.10

Measurement
Speed 1/min : 975

1st pressure hPa : -
Rack travel in m: 7.90...8.30
2nd pressure hPa : 325
Rack travel in m: 9.40...9.50
3rd pressure hPa : 640
Rack travel in m: 11.60...12.00

START CUT-OUT

Speed 1/min : 250 (255)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 600
Del.quantity cm³/ : 240.5...246.5
1000 s: (237.5...249.5)
Spread cm³ : 8.00
1000 s: (12.0)
Speed rpm : 875
Del.quantity cm³/ : 199.0...201.0 *
1000 s: (180.5...207.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 149.0...153.0
1000 s: (147.0...155.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 12.00
Speed rpm : 1015...1045

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 190.0...230.0
1000 s: (180.0...240.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.80...5.00
Del.quantity cm³/ : 40.0...46.0
1000 s: (38.0...48.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks: : MACK # 313GC5188-P8

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

* This test specification applies only
to the engine/nozzle-and-holder
assemblies on an injection-pump test
bench: setting for test equipment,
check value for engine equipment.

Bow dimension:

Sliding-sleeve position = 37.0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : FOR 7,8 k
 Edition : 16.11.90
 Replaces : 10.8.90
 Test oil : ISO-4113

Combination no. : 0 402 746 889

Injection pump
 Pump designation : PES6P120A720RS7179
 EP type number : 0 412 726 826
 Governor
 Governor design. : RQV350...1000PA917-1
 K
 Governor no. : 0 421 815 236

Customer-spec. information
 Customer : FNH

Engine : 7.8L

1st version kW : 160.0
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 072

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : +.35...4.45
 (4.30...4.50)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Phasing Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.50...12.60

Del.quantity cm³/ : 15.9...16.1

100 s: (15.6...16.4)

Spread cm³ : 0.7

100 s: (1.1)

2nd speed rpm : 350.0
 Rack travel in mm : 5.0...5.4
 Del.quantity cm³/ : 2.0...2.6
 100 s: (1.8...2.8)
 Spread cm³ : 0.5
 100 s: (0.9)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350
 travel mm : 2.10...2.40
 2nd speed rpm : 450
 travel mm : 3.50...3.90
 3rd speed rpm : 800
 travel mm : 6.90...7.30
 4th speed rpm : 1000
 travel mm : 8.60...8.80
 5th speed rpm : 1200
 travel mm : 10.70...11.10

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1230
 Rack travel in mm : 6.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000
Aneroid pressure hPa : 1400
Del.quantity : 159.0...161.0
1000 : (156.0...164.0)
Spread cm³ : 7.00
1000 : (11.00)

RATED SPEED

1st version
Control lever
position degrees: 112...120

Testing:
1st rack travel in: 11.50
Speed rpm : 1050...1060
2nd rack travel in: 4.00
Speed rpm : 1165...1195
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 63...71

Testing:
Speed rpm : 100
Minimum rack trave: 6.70
Speed rpm : 350
Rack travel in mm : 5.00...5.40

CONSTANT REGULATION
Speed rpm : 320...500

TORQUE CONTROL
Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 1000
Rack travel in m: 12.50...12.60
2nd speed rpm : 750
Rack travel in m: 13.10...13.30
3rd speed rpm : 650
Rack travel in m: 12.50...12.90

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 750
Pressure hPa : 1400
Rack travel mm : 13.10...13.30

Measurement
Speed 1/min : 750

1st pressure hPa : -
Rack travel in m: 8.00...8.40
2nd pressure hPa : 310

Rack travel in m: 9.60...9.70
3rd pressure hPa : 620
Rack travel in m: 11.80...12.20

START CUT-OUT

Speed 1/min : 290 (310)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1400
Speed rpm : 750
Del.quantity cm³/s : 187.0...193.0
1000 s: (184.0...196.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/s : 101.0...103.0
1000 s: (98.0...106.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.50
Speed rpm : 1050...1060

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/s : 150.0...180.0
1000 s: (146.0...186.0)
Rack travel in mm : 10.90...11.50

Remarks: : FNH # E9HN-9A543-PA

Bow dimension:
Sliding-sleeve position = 37.0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 h
 Edition : 15.11.90
 Replaces : 8.8.90
 Test oil : ISO-4113

Combination no. : 0 402 746 890

Injection pump
 Pump designation : PES6P120A720RS7200
 EP type number : 0 412 726 833
 Governor
 Governor design. : RQV325...875PA944-5K
 Governor no. : 0 421 815 240

Customer-spec. information
 Customer : MACK TRUCKS

Engine : BM7-275

1st version kW : 202.0
 Rated speed : 1950

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 22...24

Prestroke mm : 3.25...3.35
 : (3.20...3.40)
 Rack travel in mm : 11.00...13.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 13.20...13.30

Del.quantity cm³/ : 23.5...23.7

100 s: (23.2...24.0)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.8...5.0

Del.quantity cm³/ : 4.0...4.6

100 s: (3.8...4.8)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.40...1.60

2nd speed rpm : 450

travel mm : 3.30...3.70

3rd speed rpm : 700

travel mm : 7.90...8.30

4th speed rpm : 900

travel mm : 9.40...9.60

5th speed rpm : 1050

travel mm : 10.60...11.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1200

Del.quantity : 235.5...237.5

1000 : (232.5...240.5)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever
position degrees: 60...68

Testing:

1st rack travel in: 12.20
Speed rpm : 915...945
2nd rack travel in: 4.00
Speed rpm : 1065...1075
4th rack travel in: 1200
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 8...16

Testing:

Speed rpm : 275
Minimum rack trave: 6.00
Speed rpm : 325
Rack travel in mm : 4.80...5.00

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 875
Rack travel in m: 13.20...13.30
2nd speed rpm : 510
Rack travel in m: 13.80...14.00
3rd speed rpm : 600
Rack travel in m: 13.80...14.00
4th speed rpm : 450
Rack travel in m: 13.10...13.50

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 510
Pressure hPa : 1200
Rack travel mm : 13.80...14.00

Measurement

Speed 1/min : 510

1st pressure hPa : -
Rack travel in m: 8.60...9.00
2nd pressure hPa : 310
Rack travel in m: 10.10...10.20
3rd pressure hPa : 635
Rack travel in m: 12.50...12.90

START CUT-OUT

Speed 1/min : 250 (255)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 510
Del.quantity cm³/ 1000 s: 309.0...315.0
1000 s: (306.0...318.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: 1200
Speed rpm : 875
Del.quantity cm³/ 1000 s: 199.0...201.0 *
1000 s: (150.0...172.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ 1000 s: 155.5...159.5
1000 s: (153.5...161.5)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 12.20
Speed rpm : 915...945

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ 1000 s: 190.0...230.0
1000 s: (180.0...240.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.80...5.00
Del.quantity cm³/ 1000 s: 40.0...46.0
1000 s: (38.0...48.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

: MACK # 313GC5188-P4

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

Bow dimension:

Sliding-sleeve position = 37.0 mm

* This test specification applies only
to the engine/nozzle-and-holder
assemblies on an injection-pump test

bench: setting for test equipment,
check value for engine equipment.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 h4
 Edition : 15.11.90
 Replaces : 17.9.90
 Test oil : ISO-4113

Combination no. : 0 402 746 891

Injection pump
 Pump designation : PES6P120A720RS7200
 EP type number : 0 412 726 833
 Governor
 Governor design. : RQV325...875PA944-6K
 Governer no. : 0 421 815 241

Customer-spec. information
 Customer : MACK TRUCKS

Engine : EM7-250

1st version kW : 187.0
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 22...24

Prestroke mm : 3.25...3.35
 : (3.20...3.40)
 Rack travel in mm : 11.00...13.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 12.50...12.60

Del.quantity cm³/

100 s: (21.2...22.0)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.8...5.0

Del.quantity cm³/

100 s: (3.8...4.8)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.40...1.60

2nd speed rpm : 450

travel mm : 3.30...3.70

3rd speed rpm : 700

travel mm : 7.90...8.30

4th speed rpm : 900

travel mm : 9.40...9.60

5th speed rpm : 1050

travel mm : 10.60...11.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1200

Del.quantity : 215.0...217.0

1000 : (212.0...220.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 60...68

Testing:

1st rack travel in: 11.50
Speed rpm : 915...945
2nd rack travel in: 4.00
Speed rpm : 1045...1055
4th rack travel in: 1200
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 8...16

Testing:

Speed rpm : 275
Minimum rack trave: 6.00
Speed rpm : 325
Rack travel in mm : 4.80...5.00

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 875
Rack travel in m: 12.50...12.60
2nd speed rpm : 510
Rack travel in m: 13.40...13.60
3rd speed rpm : 600
Rack travel in m: 13.40...13.60
4th speed rpm : 450
Rack travel in m: 12.70...13.10

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 510
Pressure hPa : 1200
Rack travel mm : 13.40...13.60

Measurement

Speed 1/min : 510

1st pressure hPa : -

Rack travel in m: 8.60...9.00

2nd pressure hPa : 285

Rack travel in m: 10.00...10.10

3rd pressure hPa : 570

Rack travel in m: 12.10...12.50

START CUT-OUT

L06

Speed 1/min : 250 (255)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 510
Del.quantity cm³/ : 291.5...297.5
1000 s: (288.5...300.5)
Spread cm³ : 8.00
1000 s: (12.0)
Speed rpm : 875
Del.quantity cm³/ : 199.0...201.0 *
1000 s: (150.0...172.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 153.0...157.0
1000 s: (151.0...159.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.50
Speed rpm : 915...945

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 190.0...230.0
1000 s: (180.0...240.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.80...5.00
Del.quantity cm³/ : 40.0...46.0
1000 s: (38.0...48.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

: MACK # 313GC5188-P2

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Bow dimension:

Sliding-sleeve position = 37.0 mm
* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment,

check value for engine equipment.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12.0 h5
 Edition : 15.11.90
 Replaces : 5.10.90
 Test oil : ISO-4113

Combination no. : 0 402 746 892

Injection pump
 Pump designation : PES6P120A720RS7200
 EP type number : 0 412 726 833
 Governor
 Governor design. : RQV325...975PA944-7K
 Governer no. : 0 421 815 242

Customer-spec. information
 Customer : MACK TRUCKS

Engine : E7-250A

1st version kW : 180.0
 Rated speed : 1950

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 22...24

Prestroke mm : 3.25...3.35
 : (3.20...3.40)
 Rack travel in mm : 11.00...13.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 975

Rack travel in mm : 12.30...12.40

Del.quantity cm³/ : 20.5...20.7

100 s: (20.2...21.0)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.8...5.0

Del.quantity cm³/ : 4.0...4.6

100 s: (3.8...4.8)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.40...1.60

2nd speed rpm : 450

travel mm : 2.80...3.20

3rd speed rpm : 950

travel mm : 7.90...8.10

4th speed rpm : 1200

travel mm : 10.20...10.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 975

Aneroid pressure h: 1200

Del.quantity : 205.5...207.5

1000 : (202.5...210.5)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 54...62

Testing:
1st rack travel in: 11.30
Speed rpm : 1015...1045
2nd rack travel in: 4.00
Speed rpm : 1175...1185
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 8...16

Testing:
Speed rpm : 275
Minimum rack trave: 6.00
Speed rpm : 325
Rack travel in mm : 4.80...5.00

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 975
Rack travel in m: 12.30...12.40
2nd speed rpm : 600
Rack travel in m: 12.20...12.40
3rd speed rpm : 800
Rack travel in m: 12.40...12.60
4th speed rpm : 500
Rack travel in m: 11.40...11.80

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 975
Pressure hPa : 1200
Rack travel mm : 12.30...12.40

Measurement
Speed 1/min : 975

1st pressure hPa : -
Rack travel in m: 8.60...9.00
2nd pressure hPa : 330
Rack travel in m: 9.70...9.80
3rd pressure hPa : 570
Rack travel in m: 11.30...11.70

START CUT-OUT

Speed 1/min : 250 (255)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 600
Del.quantity cm³/ 1000 s: 233.0...239.0
1000 s: (230.0...242.0)
Spread cm³ : 8.00
1000 s: (12.0)
Speed rpm : 875
Del.quantity cm³/ 1000 s: 199.0...201.0 *
1000 s: (150.0...172.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ 1000 s: 154.0...158.0
1000 s: (152.0...160.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.30
Speed rpm : 1015...1045

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ 1000 s: 190.0...230.0
1000 s: (180.0...240.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.80...5.00
Del.quantity cm³/ 1000 s: 40.0...46.0
1000 s: (38.0...48.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks: : MACK # 313GC5188-P6

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

Bow dimension:
Sliding-sleeve position = 37.0 mm
* This test specification applies only
to the engine/nozzle-and-holder
assemblies on an injection-pump test
bench: setting for test equipment,
check value for engine equipment.

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 h2
 Edition : 15.11.90
 Replaces : 17.9.90
 Test oil : ISO-4113

Combination no. : 0 402 746 896

Injection pump
 Pump designation : PES6P120A720RS7200
 EP type number : 0 412 726 833
 Governor
 Governor design. : RQV325...900PA944-11
 K
 Governer no. : 0 421 815 260

Customer-spec. information
 Customer : MACK TRUCKS

Engine : E7-350

1st version kW : 261.0
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 11.00...13.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Phasing :
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 14.50...14.60

Del.quantity cm³/ : 27.7...27.9

100 s: (27.4...28.2)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 335.0
 Rack travel in mm : 4.7...4.9
 Del.quantity cm³/ : 3.3...3.9
 100 s: (3.1...4.1)
 Spread cm³ : 0.8
 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.40...1.60
 2nd speed rpm : 450
 travel mm : 2.80...3.20
 3rd speed rpm : 700
 travel mm : 6.00...6.40
 4th speed rpm : 900
 travel mm : 8.50...8.70
 5th speed rpm : 1050
 travel mm : 9.80...10.20

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900
 Aneroid pressure h: 1200
 Del.quantity : 277.5...279.5
 1000 : (274.5...282.5)
 Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 59...67

Testing:

1st rack travel in: 13.50

Speed rpm : 940...950

2nd rack travel in: 4.00

Speed rpm : 1105...1135

4th rack travel in: 1200

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 8...16

Testing:

Speed rpm : 275

Minimum rack trave: 6.00

Speed rpm : 325

Rack travel in mm : 5.10...5.30

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 900

Rack travel in m: 14.50...14.60

2nd speed rpm : 625

Rack travel in m: 13.60...13.80

3rd speed rpm : 800

Rack travel in m: 14.00...14.20

4th speed rpm : 675

Rack travel in m: 13.60...13.80

5th speed rpm : 500

Rack travel in m: 11.90...12.30

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 900

Pressure hPa : 1200

Rack travel mm : 14.50...14.60

Measurement

Speed 1/min : 900

1st pressure hPa : -

Rack travel in m: 8.00...8.40

2nd pressure hPa : 400

Rack travel in m: 9.80...9.90

3rd pressure hPa : 775

Rack travel in m: 12.70...13.10

START CUT-OUT

Speed 1/min : 250 (255)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 625

Del.quantity cm³/ : 290.0...296.0
1000 s: (287.0...299.0)

Spread cm³ : 8.00

1000 s: (12.0)

Speed rpm : 875

Del.quantity cm³/ : 199.0...201.0 *

1000 s: (180.5...207.0)

Aneroid pressure h: -

Speed rpm : 400

Del.quantity cm³/ : 150.0...154.0
1000 s: (148.0...156.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.50

Speed rpm : 940...950

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm³/ : 190.0...230.0
1000 s: (180.0...240.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 335

Rack travel in mm : 4.70...4.90

Del.quantity cm³/ : 33.0...39.0
1000 s: (31.0...41.0)

Spread cm³ : 8.00

1000 s: (12.00)

Remarks:

: MACK # 313GC5188-P12

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

Bow dimension:

Sliding-sleeve position = 37.0 mm

* This test specification applies only

to the engine/nozzle-and-holder
assemblies on an injection-pump test
bench: setting for test equipment,
check value for engine equipment.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12.0 h1
 Edition : 15.11.90
 Replaces : 5.10.90
 Test oil : ISO-4113

Combination no. : 0 402 746 897

Injection pump
 Pump designation : PES6P120A720RS7200
 EP type number : 0 412 726 833
 Governor
 Governor design. : RQV325...875PA944-12
 K
 Governor no. : 0 421 815 261

Customer-spec. information
 Customer : MACK TRUCKS

Engine : EM7-300

1st version kW : 224.0
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.25...3.35
 : (3.20...3.40)
 Rack travel in mm : 11.00...13.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Phasing :
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 14.00...14.10

Del.quantity cm³/ : 25.0...25.2

100 s: (24.7...25.5)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 325.0
 Rack travel in mm : 5.1...5.5
 Del.quantity cm³/ : 4.0...4.6
 100 s: (3.8...4.8)
 Spread cm³ : 0.8
 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed	rpm	: 325
travel mm		: 1.40...1.60
2nd speed	rpm	: 450
travel mm		: 3.30...3.70
3rd speed	rpm	: 700
travel mm		: 7.90...8.30
4th speed	rpm	: 900
travel mm		: 9.40...9.60
5th speed	rpm	: 1050
travel mm		: 10.60...11.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed	rpm	: 875
Aneroid pressure h:		1200
Del.quantity		: 250.0...252.0
1000		: (247.0...255.0)
Spread	cm ³	: 5.00
1000		: (9.00)

RATED SPEED

1st version

Control lever

position degrees: 61...69

Testing:

1st rack travel in: 13.00
Speed rpm : 915...945
2nd rack travel in: 4.00
Speed rpm : 1075...1085
4th rack travel in: 1200
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 8...16

Testing:

Speed rpm : 275
Minimum rack trave: 6.00
Speed rpm : 325
Rack travel in mm : 5.10...5.50

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 875
Rack travel in m: 14.00...14.10
2nd speed rpm : 510
Rack travel in m: 14.70...14.90
3rd speed rpm : 575
Rack travel in m: 14.70...14.90
4th speed rpm : 450
Rack travel in m: 13.80...14.20

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 510

Pressure hPa : 1200

Rack travel mm : 14.70...14.90

Measurement

Speed 1/min : 510

1st pressure hPa : -

Rack travel in m: 8.70...9.10

2nd pressure hPa : 370

Rack travel in m: 10.30...10.40

3rd pressure hPa : 760

Rack travel in m: 13.30...13.70

START CUT-OUT

Speed 1/min : 250 (255)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 510
Del.quantity cm³/ : 328.0...334.0
1000 s: (325.0...337.0)
Spread cm³ : 8.00
1000 s: (12.0)
Speed rpm : 875
Del.quantity cm³/ : 199.0...201.0 *
1000 s: (159.5...183.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 156.0...160.0
1000 s: (154.0...162.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.00
Speed rpm : 915...945

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 190.0...230.0
1000 s: (180.0...240.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 325
Rack travel in mm : 5.10...5.50
Del.quantity cm³/ : 40.0...46.0
1000 s: (38.0...48.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

: MACK # 313GC5188-P10

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

Bow dimension:

Sliding-sleeve position = 37.0 mm

* This test specification applies only
to the engine/nozzle-and-holder
assemblies on an injection-pump test

bench: setting for test equipment,
check value for engine equipment.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 j
 Edition : 19.10.90
 Replaces : -
 Test oil : ISO-4113

Combination no. : 0 402 746 899

Injection pump
 Pump designation : PES6P120A720RS7222
 EP type number : 0 412 726 839
 Governor
 Governor design. : RQV325...900PA909-1K
 Governor no. : 0 421 815 211

Customer-spec. information
 Customer : MACK

Engine : E7-350 4VH

1st version kW : 261.0
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.60...13.70

Del.quantity cm³/ : 23.1...23.3

100 s: (22.8...23.6)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.7...4.9

Del.quantity cm³/ : 4.0...4.6

100 s: (3.7...4.9)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed	rpm	: 325
travel mm		: 1.20...1.40
2nd speed	rpm	: 450
travel mm		: 2.80...3.20
3rd speed	rpm	: 650
travel mm		: 5.60...5.80
4th speed	rpm	: 900
travel mm		: 8.30...8.50
5th speed	rpm	: 1100
travel mm		: 10.30...10.80

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1110

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 900

Aneroid pressure h: 1200
Del.quantity : 231.5...233.5
1000 : (228.5...236.5)
Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 58...66

Testing:

1st rack travel in: 12.60
Speed rpm : 940...950
2nd rack travel in: 4.00
Speed rpm : 1080...1110
4th rack travel in: 1200
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 7...15

Testing:

Speed rpm : 275
Minimum rack trave: 5.90
Speed rpm : 325
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 900
Rack travel in m: 13.60...13.70
2nd speed rpm : 625
Rack travel in m: 13.30...13.50
3rd speed rpm : 500
Rack travel in m: 0.00...12.00

Aneroid/Altitude Compensator Test

1st version
Setting
Speed rpm : 900
Pressure hPa : 1200
Rack travel mm : 13.60...13.70

Measurement
Speed 1/min : 900

1st pressure hPa : -
Rack travel in m: 8.00...8.40
2nd pressure hPa : 325
Rack travel in m: 9.40...9.50

3rd pressure hPa : 685
Rack travel in m: 12.10...12.50

START CUT-OUT

Speed 1/min : 275 (285)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 625
Del.quantity cm³/s : 263.0...269.0
1000 s: (260.0...272.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/s : 153.0...157.0
1000 s: (151.0...159.0)

BREAKAWAY

1st version
1mm .ack travel less than
full load rack tr: 12.60
Speed rpm : 940...950

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/s : 175.0...215.0
1000 s: (165.0...225.0)
Rack travel in mm : 9.00...11.00

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.70...4.90
Del.quantity cm³/s : 40.0...46.0
1000 s: (37.0...49.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks: : MACK # 313GC5185-P2

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

Bow dimension:
Sliding-sleeve position = 37.0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI 8,8 K 6
 Edition : 14.09.90
 Replaces : 05.11.86
 Test oil : ISO-4113
 Combination no. : 0 403 446 180
 Injection pump
 Pump designation : PES6MW100/320RS1016
 EP type number : 0 413 406 010
 Governor
 Governor design. : RQV300...1300MW25-6
 Governer no. : 0 420 083 115
 Customer-spec. information
 Customer : RVI
 Engine : MIDR-062-12-I
 1st version kW : 130.0
 Rated speed : 2600
TEST BENCH REQUIREMENTS
 Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 021
 Inlet press., bar : 2.50
 Test nozzle holder assembly : 0 681 343 009
 Opening pressure, bar : 173...176
 Test Lines : 1 680 750 008
 Outside diameter x Wall thickness x Length mm : 6.00X2.00X600
 (A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____
BEGINNING OF DELIVERY
 Test pressure, bar: 30...32
 Prestroke mm : 3.00...3.10
 : (2.95...3.15)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 11.50...11.60

Del.quantity cm³/ : 9.1...9.3

100 s: (8.9...9.5)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.30...6.40

Del.quantity cm³/ : 0.9...1.3

100 s: (0.7...1.6)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1300

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 91.0...93.0

1000 : (89.0...95.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 61...69

Testing:

1st rack travel in: 10.50

Speed rpm : 1350...1370

2nd rack travel in: 4.00

Speed rpm : 1480...1510

4th rack travel in: 1600

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 10...18
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.6
Speed rpm : 300
Rack travel in mm : 6.30...6.40
Speed rpm : 200
Maximum rack trave: 3.70

CONSTANT REGULATION
Speed rpm : 325...550

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 220
Rack travel mm : 9.90...10.00

Measurement
Speed 1/min : 500

1st pressure hPa : 700
Rack travel in m: 11.50...11.60
Rack travel in m: 9.30...9.40
3rd pressure hPa : 265
Rack travel in m: 10.80...11.10

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 700
Speed rpm : 900
Del.quantity cm³/ : 88.0...92.0
1000 s: (86.0...94.0)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 48.0...50.0
1000 s: (46.0...52.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.50
Speed rpm : 1350...1370

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 100.0...110.0
1000 s: (97.0...113.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.30...6.40
Del.quantity cm³/ : 9.5...13.5
1000 s: (7.0...16.0)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:
Start-of-delivery mark 10.5° cam angle
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 71
 Edition : 16.11.90
 Replaces : 16.02.90
 Test oil : ISO-4113

 Combination no. : 0 403 446 226

 Injection pump
 Pump designation : PES6MW100/720RS1131-
 1
 EP type number : 0 413 406 165
 Governor
 Governor design. : RQ300/1300MW105
 Governor no. : 0 420 082 039

 Customer-spec. information
 Customer : MB-NFZ

 Engine : OM366LA

 1st version kW : 177.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

 Overflow valve : 1 417 413 047

 Inlet press., bar : 1.50

 Test nozzle holder assembly : 0 681 343 009

 Opening pressure, bar : 172...175

 Test Lines : 1 680 750 015

 Outside diameter x Wall thickness x Length mm : 6.00x1.50x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 14.60...14.70

Del.quantity cm³/ : 12.0...12.2

100 s: (11.8...12.4)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.3...6.5

Del.quantity cm³/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 9.40...9.80

2nd speed rpm : 1360

travel mm : 7.20...7.40

3rd speed rpm : 550

travel mm : 4.20...4.80

4th speed rpm : 300

travel mm : 1.30...1.70

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 1200

Rack travel in mm : 14.70...16.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1000

Del.quantity : 120.0...122.0

1000 : (118.0...124.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 101...109

Setting point:
Speed rpm : 1200
Rack travel in mm : 15.5

Testing:
1st rack travel in: 13.60
Speed rpm : 1345...1360
2nd rack travel in: 4.00
Speed rpm : 1450...1480
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 70...78
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.4

Testing:
Speed rpm : 100
Minimum rack trave: 9.00
Speed rpm : 300
Rack travel in mm : 6.30...6.50

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.60...10.70

Measurement
Speed 1/min : 500

1st pressure hPa : 200
Rack travel in m: 10.90...11.10
2nd pressure hPa : 500
Rack travel in m: 13.50...13.70
3rd pressure hPa : 1000
Rack travel in m: 14.60...14.70

START CUT-OUT

Speed 1/min : 180 (200)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1000
Speed rpm : 750

Del.quantity cm³/ : 111.0...115.0
1000 s: (109.0...117.0)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 41.0...43.0
1000 s: (39.0...45.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 13.60
Speed rpm : 1345...1360

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 100.0...110.0
1000 s: (97.0...113.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.30...6.50
Del.quantity cm³/ : 10.0...14.0
1000 s: (7.5...16.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:
:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 65
 Edition : 16.11.90
 Replaces : 31.08.90
 Test oil : ISO-4113

 Combination no. : 0 403 446 259

 Injection pump
 Pump designation : PES6MW100/720RS1131-
 1
 EP type number : 0 413 406 165
 Governor
 Governor design. : RQV300...1300MW68-2
 Governor no. : 0 420 083 224

 Customer-spec. information
 Customer : MB-NFZ

 Engine : OM366LA

 1st version kW : 177.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

 Overflow valve : 1 417 413 047

 Inlet press., bar : 1.50

 Test nozzle holder assembly : 0 681 343 009

 Opening pressure, bar : 172...175

 Test lines : 1 680 750 015

 Outside diameter x Wall thickness x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 14.40...14.50

Del.quantity cm³/ : 11.4...11.6

100 s: (11.2...11.8)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.3...6.5

Del.quantity cm³/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 9.40...9.80

2nd speed rpm : 1350

travel mm : 8.40...8.60

3rd speed rpm : 600

travel mm : 3.90...4.50

4th speed rpm : 300

travel mm : 0.80...1.20

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1350

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1000

Del.quantity : 114.0...116.0

1000 : (112.0...118.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 116...124

Testing:

1st rack travel in: 13.40
Speed rpm : 1340...1350
2nd rack travel in: 4.00
Speed rpm : 1480...1510
4th rack travel in: 1600
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 78...86
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.4

Testing:

Speed rpm : 100
Minimum rack trave: 9.00
Speed rpm : 300
Rack travel in mm : 6.30...6.50

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.20...10.30

Measurement
Speed 1/min : 500

1st pressure hPa : 200
Rack travel in m: 11.50...11.70
2nd pressure hPa : 400
Rack travel in m: 13.30...13.50
3rd pressure hPa : 1000
Rack travel in m: 14.40...14.50

START CUT-OUT

Speed 1/min : 180 (200)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1000
Speed rpm : 750
Del.quantity cm³/ : 106.5...109.5
1000 s: (104.0...112.0)
Spread cm³ : 5.00
1000 s: (7.0)

Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 35.0...37.0
1000 s: (33.0...39.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 13.40
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 100.0...110.0
1000 s: (97.0...113.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.30...6.50
Del.quantity cm³/ : 10.0...14.0
1000 s: (7.5...16.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC 7,6 V 3
 Edition : 30.11.90
 Replaces : -
 Test oil : ISO-4113

Combination no. : 0 403 446 266

Injection pump
 Pump designation : PES6MW100/320RS1185
 EP type number : 0 413 406 170
 Governor
 Governor design. : RQV350...1200MW46-35
 Governor no. : 0 420 083 229

Customer-spec. information

Customer : NAVISTAR

Engine : DTA-466

1st version kW : 186.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.75...3.85
 : (3.70...3.90)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 13.50...13.60

Del.quantity cm³/ : 13.7...13.9

100 s: (13.5...14.1)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.0...6.2

Del.quantity cm³/ : 1.4...1.8

100 s: (1.1...2.0)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 8.80...9.20

2nd speed rpm : 1250

travel mm : 7.90...8.10

3rd speed rpm : 550

travel mm : 3.10...3.70

4th speed rpm : 350

travel mm : 1.30...1.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800

Aneroid pressure h: 900

Del.quantity : 137.0...139.0

1000 : (135.0...141.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 100...108

Testing:
1st rack travel in: 12.50
Speed rpm : 1280...1300
2nd rack travel in: 4.00
Speed rpm : 1415...1425
4th rack travel in: 1500
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 64...72
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 6.1

Testing:
Speed rpm : 100
Minimum rack trave: 9.00
Speed rpm : 350
Rack travel in mm : 6.00...6.20

CONSTANT REGULATION
Speed rpm : 360...450

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 225
Rack travel mm : 10.50...10.60

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.50...9.6060
2nd pressure hPa : 525
Rack travel in m: 12.30...12.70
3rd pressure hPa : 900
Rack travel in m: 13.50...13.60

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 1200
Del.quantity cm3/ : 134.0...138.0
1000 s: (132.0...140.0)
Spread cm3 : 5.00
1000 s: (7.0)
Aneroid pressure h: -

Speed rpm : 500
Del.quantity cm3/ : 62.5...64.5
1000 s: (60.5...66.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 12.50
Speed rpm : 1280...1300

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 140.0...180.0
1000 s: (137.0...183.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 6.00...6.20
Del.quantity cm3/ : 14.0...18.0
1000 s: (11.5...20.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks: : IHC #1817113C91

Only perform pump setting with original
overflow valve without IH hose and
restrictor 1.2 mm diameter.
In unlatched condition, do not
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before
shutoff.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC 7,6 V 2
 Edition : 16.11.90
 Replaces : -
 Test oil : ISO-4113

Combination no. : 0 403 446 267

Injection pump
 Pump designation : PES6MW100/320RS1185
 EP type number : 0 413 406 170
 Governor
 Governor design. : RQV350...1200MW46-36
 Governor no. : 0 420 083 230

Customer-spec. information
 Customer : NAVISTAR

Engine : DTA-466

1st version kW : 156.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 3.75...3.85
 : (3.70...3.90)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 12.70...12.80

Del.quantity cm³/ : 12.5...12.7

100 s: (12.3...12.9)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0
 Rack travel in mm : 6.0...6.2
 Del.quantity cm³/ : 1.4...1.8
 100 s: (1.1...2.0)

Spread cm³ : 0.3
 100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350
 travel mm : 8.30...8.50
 2nd speed rpm : 1460
 travel mm : 9.10...9.50
 3rd speed rpm : 550
 travel mm : 3.10...3.70
 4th speed rpm : 350
 travel mm : 1.30...1.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800
 Aneroid pressure h: 900
 Del.quantity : 125.5...127.5
 1000 : (123.5...129.5)
 Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version
 Control lever
 position degrees: 97...105

Testing:
1st rack travel in: 11.70
Speed rpm : 1275...1295
2nd rack travel in: 4.00
Speed rpm : 1410...1420
4th rack travel in: 1500
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 62...70
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 6.1

Testing:
Speed rpm : 100
Minimum rack trave: 9.00
Speed rpm : 350
Rack travel in mm : 6.00...6.20

CONSTANT REGULATION
Speed rpm : 360...450

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 280
Rack travel mm : 10.70...10.80

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.00...10.10
2nd pressure hPa : 500
Rack travel in m: 12.00...12.40
3rd pressure hPa : 900
Rack travel in m: 12.70...12.80

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 1200
Del.quantity cm3/ : 124.5...128.5
1000 s: (122.5...130.5)
Spread cm3 : 5.00
1000 s: (7.0)
Aneroid pressure h: -

Speed rpm : 500
Del.quantity cm3/ : 71.5...73.5
1000 s: (69.5...75.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.70
Speed rpm : 1275...1295

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 140.0...180.0
1000 s: (137.0...183.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 6.00...6.20
Del.quantity cm3/ : 14.0...18.0
1000 s: (11.5...20.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:
: IHC #1817110C91

Only perform pump setting with original
overflow valve without IH hose and
restrictor 1.2 mm diameter.
In unlatched condition, do not
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before
shutoff.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC 7,6 V 1
 Edition : 16.11.90
 Replaces : -
 Test oil : ISO-4113

Combination no. : 0 403 446 268

Injection pump
 Pump designation : PES6MW100/320RS1185
 EP type number : 0 413 406 170
 Governor
 Governor design. : RQV350...1200MW46-37
 Governor no. : 0 420 083 231

Customer-spec. information
 Customer : NAVISTAR

Engine : DTA-466

1st version kW : 156.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 3.75...3.85
 : (3.70...3.90)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 12.70...12.80

Del.quantity cm³/ : 12.5...12.7

100 s: (12.3...12.9)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.0...6.2

Del.quantity cm³/ : 1.4...1.8

100 s: (1.1...2.0)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 8.30...8.50

2nd speed rpm : 1460

travel mm : 9.10...9.50

3rd speed rpm : 550

travel mm : 3.10...3.70

4th speed rpm : 350

travel mm : 1.30...1.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800

Aneroid pressure h: 900

Del.quantity : 125.5...127.5

1000 : (123.5...129.5)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 97...105

Testing:
1st rack travel in: 11.70
Speed rpm : 1275...1295
2nd rack travel in: 4.00
Speed rpm : 1410...1420
4th rack travel in: 1500
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 62...70
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 6.1

Testing:
Speed rpm : 100
Minimum rack trave: 9.00
Speed rpm : 350
Rack travel in mm : 6.00...6.20

CONSTANT REGULATION
Speed rpm : 360...450

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 180
Rack travel mm : 9.20...9.30

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 8.10...8.20
2nd pressure hPa : 435
Rack travel in m: 11.40...11.80
3rd pressure hPa : 900
Rack travel in m: 12.70...12.80

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 1200
Del.quantity cm3/ : 124.5...128.5
1000 s: (122.5...130.5)
Spread cm3 : 5.00
1000 s: (7.0)
Aneroid pressure h: -

Speed rpm : 500
Del.quantity cm3/ : 45.0...47.0
1000 s: (43.0...49.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.70
Speed rpm : 1275...1295

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 140.0...180.0
1000 s: (137.0...183.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 6.00...6.20
Del.quantity cm3/ : 14.0...18.0
1000 s: (11.5...20.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks: : IHC #1817111C91

Only perform pump setting with original
overflow valve without IH hose and
restrictor 1.2 mm diameter.
In unlatched condition, do not
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before
shutoff.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 99
 Edition : 30.11.90
 Replaces : 19.10.90
 Test oil : ISO-4113

 Combination no. : 0 403 446 270

 Injection pump
 Pump designation : PES6MW100/720RS1144
 EP type number : 0 413 406 138
 Governor
 Governor design. : RQV300...1300MW50-10
 Governor no. : 0 420 083 234

 Customer-spec. information
 Customer : MB-NFZ

 Engine : OM366A

 1st version kW : 125.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

 Overflow valve : 1 417 413 047

 Inlet press., bar : 1.50

 Test nozzle holder assembly : 0 681 343 009

 Opening pressure, bar : 172...175

 Test lines : 1 680 750 015

 Outside diameter x Wall thickness x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

 Prestroke mm : 3.70...3.80
 : (3.65...3.85)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 11.00...11.10

Del.quantity cm³/ : 7.7...7.9

100 s: (7.5...8.1)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 7.8...8.0

Del.quantity cm³/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 8.50...8.70

2nd speed rpm : 1450

travel mm : 9.50...9.90

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.70

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1350

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 900

Del.quantity : 77.0...79.0

1000 : (75.0...81.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 110...118

Testing:

1st rack travel in: 10.00
Speed rpm : 1340...1350
2nd rack travel in: 4.00
Speed rpm : 1425...1455
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 80...88
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 7.9
Speed rpm : 300
Rack travel in mm : 7.80...8.00

CONSTANT REGULATION

Speed rpm : 330...500

TORQUE CONTROL

Dimension a mm : 1.30
Torque control curve - 1st version
1st speed rpm : 1300
Rack travel in m: 11.00...11.10
2nd speed rpm : 800
Rack travel in m: 11.80...12.00
3rd speed rpm : 585
Rack travel in m: 12.30...12.40

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.00...10.10

Measurement
Speed 1/min : 500

1st pressure hPa : 340
Rack travel in m: 10.30...10.40
2nd pressure hPa : 460
Rack travel in m: 11.20...11.50
3rd pressure hPa : 500
Rack travel in m: 12.30...12.40

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 800
Del.quantity cm³/ 1000 s: 75.5...78.5
1000 s: (73.0...81.0)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: 900
Speed rpm : 585
Del.quantity cm³/ 1000 s: 68.5...71.5
1000 s: (66.0...74.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ 1000 s: 34.0...36.0
1000 s: (32.0...38.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.00
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ 1000 s: 78.0...88.0
1000 s: (75.0...91.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 300
Rack travel in mm : 7.80...8.00
Del.quantity cm³/ 1000 s: 9.0...13.0
1000 s: (6.5...15.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,1 B 1
 Edition : 23.11.90
 Replaces : -
 Test oil : ISO-4113

 Combination no. : 0 403 446 272

 Injection pump
 Pump designation : PES6MW100/720RS1131-
 1
 EP type number : 0 413 406 165
 Governor
 Governor design. : RQ300/1300MW105-1
 Governor no. : 0 420 082 048

 Customer-spec. information
 Customer : MB-NFZ

 Engine : OM366LA

 1st version kW : 155.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

 Overflow valve : 1 417 413 047

 Inlet press., bar : 1.50

 Test nozzle holder assembly : 0 681 343 009

 Opening pressure, bar : 172...175

 Test lines : 1 680 750 015

 Outside diameter x Wall thickness x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00
 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 13.20...13.30

Del.quantity cm³/ : 9.8...10.0

100 s: (9.6...10.2)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm³/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 9.40...9.80

2nd speed rpm : 1360

travel mm : 7.20...7.40

3rd speed rpm : 550

travel mm : 4.20...4.80

4th speed rpm : 300

travel mm : 1.30...1.70

GUIDE SLEEVE POSITION

Control-lever position

Degree: 105

Speed rpm : 1200

Rack travel in mm : 14.70...16.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1000

Del.quantity : 98.0...100.0

1000 : (96.0...102.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 101...109

Setting point:
Speed rpm : 1200
Rack travel in mm : 15.5

Testing:
1st rack travel in: 12.20
Speed rpm : 1345...1360
2nd rack travel in: 4.00
Speed rpm : 1450...1480
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 70...78
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.5

Testing:
Speed rpm : 200
Minimum rack trave: 8.00
Speed rpm : 300
Rack travel in mm : 6.40...6.60

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.50...10.60

Measurement
Speed 1/min : 500

1st pressure hPa : 200
Rack travel in m: 11.20...11.30
2nd pressure hPa : 350
Rack travel in m: 12.50...12.80
3rd pressure hPa : 1000
Rack travel in m: 13.20...13.30

START CUT-OUT

Speed 1/min : 180 (200)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1000
Speed rpm : 750

Del.quantity cm³/ : 85.0...89.0
1000 s: (83.0...91.0)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 36.0...38.0
1000 s: (34.0...40.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 12.20
Speed rpm : 1345...1360

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 100.0...110.0
1000 s: (97.0...113.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.40...6.60
Del.quantity cm³/ : 10.0...14.0
1000 s: (7.5...16.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 75
 Edition : 16.11.90
 Replaces : 06.09.90
 Test oil : ISO-4113

Combination no. : 0 403 476 075

Injection pump
 Pump designation : PES6MW100/720RS1130
 EP type number : 0 413 406 122
 Governor
 Governor design. : RSV350...750MW0A336-
 4
 Governer no. : 0 420 085 160

Customer-spec. information
 Customer : MB-NFZ

Engine : OM366A

1st version kW : 84.0
 Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.00...12.10

Del.quantity cm³/ : 8.0...8.2

100 s: (7.8...8.4)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.8...6.8

Del.quantity cm³/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 2.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 80.0...82.0

1000 : (78.0...84.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 74...82

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 11.00

Speed rpm : 750...755 *
2nd rack travel in: 4.00
Speed rpm : 775...788
4th rack travel in: 850
Speed rpm : 0.30...1.70

LOW IDLE 1
Control lever
position degrees: 61...69
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 6.3

Testing:
Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 350
Rack travel in mm : 5.80...6.80

SET IDLE AUXILIARY SPRING
Rack travel in mm : 2.00

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 88.0...98.0
1000 s: (85.0...101.0)

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.80...6.80
Del.quantity cm³/ : 9.0...13.0
1000 s: (6.5...15.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

* Read off speed set under 1.
Add 25...33 min⁻¹ to this speed. The
control-rod travel under 2. must be
attained with the calculated speed
profile.

Observe VDT-I-420/120

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 74
 Edition : 16.11.90
 Replaces : 06.09.90
 Test oil : ISO-4113

Combination no. : 0 403 476 078

Injection pump
 Pump designation : PES6MW100/720RS1129
 EP type number : 0 413 406 121
 Governor
 Governor design. : RSV350...750MW0A336-
 3
 Governer no. : 0 420 085 159

Customer-spec. information
 Customer : DB-NKW

Engine : OM 366 LA

1st version kW : 94.0
 Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.50...12.60

Del.quantity cm³/ : 8.5...8.7

100 s: (8.3...8.9)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.8...6.8

Del.quantity cm³/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 2.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 85.0...87.0

1000 : (83.0...89.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 74...82

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 11.50

Speed rpm : 750...755 *
2nd rack travel in: 4.00
Speed rpm : 775...788
4th rack travel in: 850
Speed rpm : 0.30...1.70

LOW IDLE 1
Control lever
position degrees: 60...68
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 6.3

Testing:
Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 350
Rack travel in mm : 5.80...6.80

SET IDLE AUXILIARY SPRING
Rack travel in mm : 2.00

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 88.0...98.0
1000 s: (85.0...101.0)

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.80...6.80
Del.quantity cm³/ : 9.0...13.0
1000 s: (6.5...15.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

* Read off speed set under 1.
Add 25...33 min⁻¹ to this speed. The
control-rod travel under 2. must be
attained with the calculated speed
profile.

Observe VDT-I-420/120

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 7,2 Y
 Edition : 19.10.90
 Replaces : 31.07.90
 Test oil : ISO-4113

Combination no. : 0 403 476 083

Injection pump
 Pump designation : PES6MW100/320RS1200-
 1
 EP type number : 0 413 406 194
 Governor
 Governor design. : RSV300...1100MW0A339
 -1
 Governor no. : 0 420 085 140

Customer-spec. information

Customer : MAN

Engine : D0826LE52/LUE51

1st version kW : 147.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60
 : (3.45...3.65)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.50...11.60

Del.quantity cm³/ : 12.7...12.9

100 s: (12.5...13.1)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 3.6...3.8

Del.quantity cm³/ : 0.6...1.0

100 s: (0.4...1.2)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.20

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1000

Del.quantity : 127.0...129.0

1000 : (125.0...131.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 96...104

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:
 1st rack travel in: 10.50
 Speed rpm : 1145...1160
 2nd rack travel in: 4.00
 Speed rpm : 1210...1240
 4th rack travel in: 1380
 Speed rpm : 0.30...1.70

LOW IDLE 1
 Control lever
 position degrees: 72...80
 Setting point w/out bumper spring
 Speed rpm : 300
 Rack travel in mm : 3.7

Testing:
 Speed rpm : 100
 Minimum rack trave: 19.00
 Speed rpm : 300
 Rack travel in mm : 3.60...3.80

SET IDLE AUXILIARY SPRING
 Rack travel in mm : 2.00

TORQUE CONTROL
 Dimension a mm : 1.00
 Torque control curve - 1st version
 1st speed rpm : 1100
 Rack travel in m: 11.50...11.60
 2nd speed rpm : 600
 Rack travel in m: 12.40...12.50
 3rd speed rpm : 800
 Rack travel in m: 12.00...12.20
 4th speed rpm : 1000
 Rack travel in m: 11.50...11.80

Aneroid/Altitude
 Compensator Test

1st version
 Setting
 Speed rpm : 500
 Pressure hPa : -
 Rack travel mm : 9.30...9.40

Measurement
 Speed 1/min : 500
 1st pressure hPa : 210
 Rack travel in m: 9.60...9.70
 2nd pressure hPa : 570
 Rack travel in m: 11.80...12.10
 3rd pressure hPa : 1000
 Rack travel in m: 12.40...12.50

FUEL DELIVERY CHARACTERISTICS

1st version
 Aneroid pressure h: 1000
 Speed rpm : 600
 Del.quantity cm3/ : 133.0...136.0
 1000 s: (130.5...138.5)
 Spread cm3 : 5.00
 1000 s: (7.0)
 Aneroid pressure h: 1000
 Speed rpm : 800
 Del.quantity cm3/ : 133.0...136.0
 1000 s: (130.5...138.5)
 Aneroid pressure h: 1000
 Speed rpm : 1000
 Del.quantity cm3/ : 125.0...128.0
 1000 s: (122.5...130.5)
 Aneroid pressure h: -
 Speed rpm : 500
 Del.quantity cm3/ : 70.0...72.0
 1000 s: (68.0...74.0)

BREAKAWAY

1st version
 1mm rack travel less than
 full load rack tr: 10.50
 Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100
 Del.quantity cm3/ : 120.0...130.0
 1000 s: (117.0...133.0)

LOW IDLE

Speed rpm : 300
 Rack travel in mm : 3.60...3.80
 Del.quantity cm3/ : 6.0...10.0
 1000 s: (4.0...12.0)
 Spread cm3 : 3.50
 1000 s: (5.50)

Remarks: : MAN #3-7063
 Setting and blocking of pointer of
 start-of-delivery sensor on cyl. 1
 start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 7,2 X
 Edition : 14.09.90
 Replaces : 03.08.90
 Test oil : ISO-4113

Combination no. : 0 403 476 084

Injection pump
 Pump designation : PES6MW100/320RS1180-
 1
 EP type number : 0 413 406 193
 Governor
 Governor design. : RSV300...1100MWA339
 -2
 Governor no. : 0 420 085 141

Customer-spec. information
 Customer : MAN

Engine : D0826TUE51/130

1st version kW : 96.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test Lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60
 : (3.45...3.65)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 8.50...8.60

Del.quantity cm³/ : 8.1...8.3

100 s: (7.9...8.5)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 4.0...4.2

Del.quantity cm³/ : 0.6...1.0

100 s: (0.4...1.2)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension
 Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1000

Del.quantity : 81.0...83.0

1000 : (79.0...85.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 92...100

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:
1st rack travel in: 7.50
Speed rpm : 1145...1160
2nd rack travel in: 4.00
Speed rpm : 1170...1200
4th rack travel in: 1350
Speed rpm : 0.50...1.70

LOW IDLE 1
Control lever
position degrees: 69...77
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 4.1

Testing:
Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 300
Rack travel in mm : 4.00...4.20

SET IDLE AUXILIARY SPRING
Rack travel in mm : 2.00

TORQUE CONTROL
Dimension a mm : 1.00
Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 8.50...8.60
2nd speed rpm : 1000
Rack travel in m: 8.60...8.80
3rd speed rpm : 800
Rack travel in m: 9.50...9.60
4th speed rpm : 600
Rack travel in m: 9.50...9.60

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.10...9.20

Measurement
Speed 1/min : 500

1st pressure hPa : 170
Rack travel in m: 9.20...9.30
2nd pressure hPa : 1000
Rack travel in m: 9.50...9.60

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1000

Speed rpm : 1000
Del.quantity cm³/ : 81.0...83.0
1000 s: (78.5...86.5)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: 1000
Speed rpm : 800
Del.quantity cm³/ : 88.5...91.5
1000 s: (86.0...94.0)
Aneroid pressure h: 1000
Speed rpm : 600
Del.quantity cm³/ : 83.0...86.0
1000 s: (80.5...88.5)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 70.0...72.0
1000 s: (68.0...74.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 7.50
Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 120.0...130.0
1000 s: (117.0...133.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 4.00...4.20
Del.quantity cm³/ : 6.0...10.0
1000 s: (4.0...12.0)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks: : MAN #3-7065
Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : PEN 6/1 Q
 Edition : 23.11.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 403 476 094
 Injection pump
 Pump designation : PES6MW100/320RS1132
 EP type number : 0 413 406 124
 Governor
 Governor design. : RSV300...1050MW4A308
 -5
 Governor no. : 0 420 085 155
 Customer-spec. information
 Customer : PENTA
 Engine : TD 61 ACE
 1st version kW : 120.0
 Rated speed : 2100
TEST BENCH REQUIREMENTS
 Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 457 413 010
 Inlet press., bar : 1.50
 Test nozzle holder assembly : 0 681 343 009
 Opening pressure, bar : 172...175
 Test lines : 1 680 750 014
 Outside diameter x Wall thickness x Length mm : 6.00X2.00X600
 (A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____
BEGINNING OF DELIVERY
 Test pressure, bar: 30...32
 Prestroke mm : 2.90...3.00
 : (2.85...3.05)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4
 Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)
BASIC SETTING
 1st speed rpm : 1000
 Rack travel in mm : 11.10...11.20
 Del.quantity cm³/ : 9.2...9.4
 100 s: (9.0...9.6)
 Spread cm³ : 0.3
 100 s: (0.6)
 2nd speed rpm : 300.0
 Rack travel in mm : 6.0...6.2
 Del.quantity cm³/ : 1.2...1.6
 100 s: (0.9...1.8)
 Spread cm³ : 0.3
 100 s: (0.5)
GUIDE SLEEVE POSITION
 Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...1.00
 Governor spring pre-tension
 Click setting x : 5.20
FULL LOAD DELIV. AT FULL LOAD STOP
 1st version
 Speed rpm : 1000
 Del.quantity : 92.0...94.0
 1000 : (90.0...96.0)
 Spread cm³ : 3.50
 1000 : (6.00)
RATED SPEED
 1st version
 Control lever
 position degrees: 74...82
 Setting point:
 Speed rpm : 800
 Rack travel in mm : 0.6
 Testing:
 1st rack travel in: 10.10

Speed rpm : 1070...1080
2nd rack travel in: 4.00
Speed rpm : 1110...1140
4th rack travel in: 1250
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 110...118
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.6

Testing:

Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 300
Rack travel in mm : 5.50...5.70

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 10.10
Speed rpm : 1070...1080

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 100.0...110.0
1000 s: (107.0...113.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.00...6.20
Del.quantity cm³/ : 12.0...16.0
1000 s: (9.5...18.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM 2,6 a
 Edition : 26.03.90
 Replaces : 24.11.89
 Test oil : ISO-4113

Combination no. : 9 400 083 422

Injection pump
 Pump designation : PES3A80D320/3RS1264
 EP type number : 9 400 083 053
 Governor
 Governor design. : RSV350...1200A2B627R
 Governer no. : 9 420 082 194

Customer-spec. information
 Customer : MWM

Engine : D225-3

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 012

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test Lines : 1 680 750 003

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.20...2.30
 : (2.15...2.35)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 2- 3

Phasing : 0-120-240
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00
 & maximum rack tra: 21.00
 Difference ° CS : 4.00...5.00

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 9.40...9.50

Del.quantity cm³/ : 5.0...5.1

100 s: (4.9...5.3)

Spread cm³ : 0.2

100 s: (0.4)

2nd speed rpm : 350.0
 Rack travel in mm : 5.9...6.1
 Del.quantity cm³/ : 1.0...1.4
 100 s: (0.8...1.6)
 Spread cm³ : 0.2
 100 s: (0.3)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension
 Click setting x : 4.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200
 Del.quantity : 50.5...51.5
 1000 : (49.0...53.0)
 Spread cm³ : 2.50
 1000 : (4.00)

RATED SPEED

1st version
 Control lever
 position degrees: 46...54

Testing:
 1st rack travel in: 8.40

Speed rpm : 1240...1250
2nd rack travel in: 4.00
Speed rpm : 1285...1315
4th rack travel in: 1400
Speed rpm : 0.30...1.70

LOW IDLE 1
Control lever
position degrees: 16...24
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.5

Testing:
Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 350
Rack travel in mm : 5.90...6.10
Rack travel in mm : 2.00
Speed rpm : 490...550

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 1200
Rack travel in m: 9.40...9.50
2nd speed rpm : 500
Rack travel in m: 9.40...9.60
5th speed rpm : 400
Rack travel in m: 10.60...11.20

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 8.40
Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.90...6.10
Del.quantity cm³/ : 10.0...14.0
1000 s: (8.0...16.0)
Spread cm³ : 2.00
1000 s: (3.50)

Remarks:

:

APPLICATION

Navy

M20

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM 5,1 a
 Edition : 26.03.90
 Replaces : 24.11.89
 Test oil : ISO-4113

Combination no. : 9 400 083 429

Injection pump
 Pump designation : PES6A80D320/3RS1261
 EP type number : 9 400 083 057
 Governor
 Governor design. : RSV350...900A7B627R
 Governor no. : 9 420 082 193

Customer-spec. information
 Customer : MWM

Engine : D225-6

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 012

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 003

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.20...2.30
 : (2.15...2.35)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00
 & maximum rack tra: 21.00
 Difference ° CS : 4.00...5.00

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 10.20...10.30

Del.quantity cm³/ : 5.1...5.2

100 s: (5.0...5.4)

Spread cm³ : 0.2

100 s: (0.4)

2nd speed rpm : 350.0

Rack travel in mm : 5.9...6.1

Del.quantity cm³/ : 0.7...1.1

100 s: (0.5...1.3)

Spread cm³ : 0.2

100 s: (0.3)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Del.quantity : 51.5...52.5

1000 : (50.0...54.0)

Spread cm³ : 2.50

1000 : (4.00)

RATED SPEED

1st version

Control lever

position degrees: 50...58

Testing:

1st rack travel in: 9.20

Speed rpm : 940...945
2nd rack travel in: 4.00
Speed rpm : 975...980
4th rack travel in: 1100
Speed rpm : 0.30...1.70

LOW IDLE 1
Control lever
position degrees: 19...27
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.5

Testing:
Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 350
Rack travel in mm : 5.90...6.10
Rack travel in mm : 2.00
Speed rpm : 450...510

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 900
Rack travel in m: 10.20...10.30
2nd speed rpm : 500
Rack travel in m: 10.20...10.40
5th speed rpm : 400
Rack travel in m: 11.40...12.00

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 9.20
Speed rpm : 940...945

STARTING FUEL DELIVERY

Speed rpm : 100
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.90...6.10
Del.quantity cm³/ s: 7.0...11.0
1000 s: (5.0...13.0)
Spread cm³ : 2.00
1000 s: (3.50)

Remarks:

:

APPLICATION

Generator

M22

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a
 Edition : 24.10.90
 Replaces : 3.7.90
 Test oil : ISO-4113

Combination no. : 9 400 083 449

Injection pump
 Pump designation : PES6A100D320/3RS2691
 EP type number : 9 410 230 025
 Governor
 Governor design. : RSV400...1100A2C2209
 R
 Governer no. : 9 420 083 201

Customer-spec. information
 Customer : CUMMINS

Engine : 6 CT 8.3 L

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...2.95)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 10.30...10.40

Del.quantity cm³/ : 9.0...9.2

100 s: (8.8...9.4)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.7...5.9

Del.quantity cm³/ : 1.6...2.0

100 s: (1.4...2.3)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 90.0...92.0

1000 : (88.0...94.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 85...93

Testing:

1st rack travel in: 9.30

Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1170...1200
4th rack travel in: 1300
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 62...70
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 5.3

Testing:

Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 400
Rack travel in mm : 5.70...5.90
Rack travel in mm : 2.00
Speed rpm : 495...555

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 10.30...10.40
2nd speed rpm : 500
Rack travel in m: 10.30...10.50
5th speed rpm : 400
Rack travel in m: 10.70...11.20

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 500
Del.quantity cm³/ : 74.0...77.0
1000 s: (71.5...79.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 9.30
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 135.0...149.0
1000 s: (132.0...152.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 5.70...5.90

Del.quantity cm³/ : 16.5...20.5
1000 s: (14.0...23.0)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:
Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a81
 Edition : 24.10.90
 Replaces : 26.3.90
 Test oil : ISO-4113

Combination no. : 9 400 083 449AB

Injection pump
 Pump designation : PES6A100D320/3RS2691
 EP type number : 9 410 230 025
 Governor
 Governor design. : RSV400...1100A2C2209
 R
 Governer no. : 9 420 083 201
 Cust. part no. : 3352892-VERSA001

Customer-spec. information
 Customer : CUMMINS

Engine : 6 CT 8.3

1st version kW : 125.1
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...2.95)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00
 & maximum rack tra: 21.00
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 10.70...10.80

Del.quantity cm³/ : 9.3...9.5

100 s: (9.1...9.7)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 400.0
 Rack travel in mm : 5.4...5.6
 Del.quantity cm³/ : 1.3...1.7
 100 s: (1.0...1.9)
 Spread cm³ : 0.3
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension
 Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000
 Del.quantity : 93.0...95.0
 1000 : (91.0...97.0)
 Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 82...90

Spread cm³ : 3.50
1000 s: (5.50)

Testing:

1st rack travel in: 9.70
Speed rpm : 1040...1050
2nd rack travel in: 4.00
Speed rpm : 1075...1105
4th rack travel in: 1250
Speed rpm : 0.30...1.70

Remarks:

:
Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1

LOW IDLE 1

Control lever
position degrees: 62...70
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 5.0

Testing:

Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 400
Rack travel in mm : 5.40...5.60
Rack travel in mm : 2.00
Speed rpm : 530...590

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1000
Rack travel in m: 10.70...10.80
2nd speed rpm : 500
Rack travel in m: 10.70...10.90
5th speed rpm : 400
Rack travel in m: 11.10...11.60

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 9.70
Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 135.0...149.0
1000 s: (132.0...152.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 5.40...5.60
Del.quantity cm³/ : 13.0...17.0
1000 s: (10.5...19.5)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a85
 Edition : 24.10.90
 Replaces : -
 Test oil : ISO-4113

 Combination no. : 9 400 083 449AG

 Injection pump
 Pump designation : PES6A100D320/3RS2691
 EP type number : 9 410 230 025
 Governor
 Governor design. : RSV400...1100A2C2209
 Governor no. : 9 420 083 201

 Cust. part no. : 3353251-VERSA006

 Customer-spec. information
 Customer : CUMMINS

 Engine : 6 CT 8.3

 1st version kW : 133.2
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

 Overflow valve : 1 417 413 047

 Inlet press., bar : 1.50

 Test nozzle holder assembly : 0 681 343 009

 Opening pressure, bar : 172...175

 Test lines : 1 680 750 014

 Outside diameter x Wall thickness x Length mm : 6.00X2.00X600

 (A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...2.95)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00
 & maximum rack tra: 21.00
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 10.70...10.80

Del.quantity cm³/ : 9.6...9.8

100 s: (9.4...10.0)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.1...5.3

Del.quantity cm³/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension
 Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000
 Del.quantity : 96.0...98.0
 1000 : (94.0...100.0)
 Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 82...90

Testing:
1st rack travel in: 9.70
Speed rpm : 1040...1050
2nd rack travel in: 4.00
Speed rpm : 1070...1100
4th rack travel in: 1250
Speed rpm : 0.30...1.70

LOW IDLE 1
Control lever
position degrees: 62...70
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 4.7

Testing:
Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 400
Rack travel in mm : 5.10...5.30
Rack travel in mm : 2.00
Speed rpm : 550...610

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 1000
Rack travel in m: 10.70...10.80
2nd speed rpm : 500
Rack travel in m: 11.40...11.60
4th speed rpm : 835
Rack travel in m: 11.00...11.20

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 500
Del.quantity cm3/ : 95.0...98.0
1000 s: (92.5...100.5)
Speed rpm : 700
Del.quantity cm3/ : 103.0...106.0
1000 s: (100.5...108.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 9.70
Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 135.0...149.0
1000 s: (132.0...152.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 5.10...5.30
Del.quantity cm3/ : 10.0...14.0
1000 s: (7.5...16.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

:
Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a80
 Edition : 24.10.90
 Replaces : 26.3.90
 Test oil : ISO-4113

Combination no. : 9 400 083 449AI

Injection pump
 Pump designation : PES6A100D320/3RS2691
 EP type number : 9 410 230 025
 Governor
 Governor design. : RSV400...1100A2C2209
 Governer no. : 9 420 083 201
 Cust. part no. : 3352894-VERSA008

Customer-spec. information
 Customer : CUMMINS

Engine : 6 CT 8.3

1st version kW : 139.8
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...2.95)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00
 & maximum rack tra: 21.00
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 11.10...11.20

Del.quantity cm³/

100 s: (10.3...10.9)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 4.7...4.9

Del.quantity cm³/

100 s: (0.5...1.4)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 105.0...107.0

1000 : (103.0...109.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 90...98

Spread cm³ : 3.50
1000 s: (5.50)

Testing:

1st rack travel in: 10.10
Speed rpm : 1290...1300
2nd rack travel in: 4.00
Speed rpm : 1325...1355
4th rack travel in: 1500
Speed rpm : 0.30...1.70

Remarks:

:
Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1

LOW IDLE 1

Control lever
position degrees: 61...69
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 4.3

Testing:

Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 400
Rack travel in mm : 4.70...4.90
Rack travel in mm : 2.00
Speed rpm : 510...570

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1250
Rack travel in m: 11.10...11.20
2nd speed rpm : 500
Rack travel in m: 11.10...11.30
5th speed rpm : 400
Rack travel in m: 11.50...12.00

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 10.10
Speed rpm : 1290...1300

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 135.0...149.0
1000 s: (132.0...152.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 4.70...4.90
Del.quantity cm³/ : 8.0...12.0
1000 s: (5.5...14.5)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a86
 Edition : 24.10.90
 Replaces : -
 Test oil : ISO-4113

 Combination no. : 9 400 083 449BB

 Injection pump
 Pump designation : PES6A100D320/3RS2691
 EP type number : 9 410 230 025
 Governor
 Governor design. : RSV400...1100A2C2209
 R
 Governer no. : 9 420 083 201

 Cust. part no. : 3352898-VERSA011

 Customer-spec. information
 Customer : CUMMINS

 Engine : 6 CT 8.3 l

 1st version kW : 179.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

 Overflow valve : 1 417 413 047

 Inlet press., bar : 1.50

 Test nozzle holder assembly : 0 681 343 009

 Opening pressure, bar : 172...175

 Test Lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...2.95)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00
 & maximum rack tra: 21.00
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.00...12.10

Del.quantity cm³/

100 s: (11.4...12.0)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.5...5.7

Del.quantity cm³/ : 1.4...1.8

100 s: (1.1...2.0)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension
 Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 116.5...118.5

1000 : (114.5...120.5)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 86...94

Testing:

1st rack travel in: 11.00
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1180...1210
4th rack travel in: 1350
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 62...70
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 5.1

Testing:

Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 400
Rack travel in mm : 5.50...5.70
Rack travel in mm : 2.00
Speed rpm : 565...625

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 12.00...12.10
2nd speed rpm : 500
Rack travel in m: 12.50...12.70
4th speed rpm : 800
Rack travel in m: 12.20...12.40

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 500
Del.quantity cm³/ : 112.0...115.0
1000 s: (109.5...117.5)
Speed rpm : 700
Del.quantity cm³/ : 124.5...127.5
1000 s: (122.0...130.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.00
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100

N04

Del.quantity cm³/ : 135.0...149.0
1000 s: (132.0...152.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 5.50...5.70
Del.quantity cm³/ : 14.0...18.0
1000 s: (11.5...20.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a79
 Edition : 24.10.90
 Replaces : 26.3.90
 Test oil : ISO-4113

Combination no. : 9 400 083 449BC

Injection pump
 Pump designation : PES6A100D320/3RS2691
 EP type number : 9 410 230 025
 Governor
 Governor design. : RSV400...1100A2C2209
 R
 Governor no. : 9 420 083 201
 Cust. part no. : 3353232-VERSA012

Customer-spec. information
 Customer : CUMMINS

Engine : 6 CT 8.3

1st version kW : 154.6
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...2.95)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00
 & maximum rack tra: 21.00
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.40...12.50

Del.quantity cm³/ : 12.0...12.2

100 s: (11.8...12.4)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 400.0
 Rack travel in mm : 5.1...5.3
 Del.quantity cm³/ : 1.0...1.4
 100 s: (0.7...1.6)
 Spread cm³ : 0.3
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension
 Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100
 Del.quantity : 120.0...122.0
 1000 : (118.0...124.0)
 Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version	Spread	cm ³ : 3.50
Control lever		1000 s: (5.50)
position degrees: 86...94		
Testing:	Remarks:	:
1st rack travel in: 11.40		
Speed rpm : 1140...1150		
2nd rack travel in: 4.00		
Speed rpm : 1185...1215		
4th rack travel in: 1350		
Speed rpm : 0.30...1.70		
LOW IDLE 1		
Control lever		
position degrees: 62...70		
Setting point w/out bumper spring		
Speed rpm : 400		
Rack travel in mm : 4.7		
Testing:		
Speed rpm : 100		
Minimum rack trave: 19.00		
Speed rpm : 400		
Rack travel in mm : 5.10...5.30		
Rack travel in mm : 2.00		
Speed rpm : 520...580		
TORQUE CONTROL		
Torque control curve - 1st version		
1st speed rpm : 1100		
Rack travel in m: 12.40...12.50		
2nd speed rpm : 500		
Rack travel in m: 12.40...12.60		
5th speed rpm : 400		
Rack travel in m: 12.80...13.30		
BREAKAWAY		
1st version		
1mm rack travel less than		
full load rack tr: 11.40		
Speed rpm : 1140...1150		
STARTING FUEL DELIVERY		
Speed rpm : 100		
Del.quantity cm ³ / : 135.0...149.0		
1000 s: (132.0...152.0)		
Rack travel in mm : 19.00...21.00		
LOW IDLE		
Speed rpm : 400		
Rack travel in mm : 5.10...5.30		
Del.quantity cm ³ / : 10.0...14.0		
1000 s: (7.5...16.5)		

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a87
 Edition : 24.10.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 9 400 083 449BD
 Injection pump
 Pump designation : PES6A100D320/3RS2691
 EP type number : 9 410 230 025
 Governor
 Governor design. : RSV400...1100A2C2209
 Governer no. : 9 420 083 201
 Cust. part no. : 3354419-VERSA013
 Customer-spec. information
 Customer : CUMMINS
 Engine : 6 CT 8.3 l
 1st version kW : 155.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 047
 Inlet press., bar : 1.50
 Test nozzle holder assembly : 0 681 343 009
 Opening pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...2.95)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00
 & maximum rack tra: 21.00
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.20...11.30

Del.quantity cm³/ : 10.6...10.8

100 s: (10.4...11.0)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 400.0
 Rack travel in mm : 5.7...5.9
 Del.quantity cm³/ : 1.6...2.0
 100 s: (1.4...2.3)
 Spread cm³ : 0.3
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension
 Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1100
 Del.quantity : 106.0...108.0
 1000 : (104.0...110.0)
 Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 85...93

Testing:

1st rack travel in: 10.20
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1175...1205
4th rack travel in: 1350
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 62...70
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 5.3

Testing:

Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 400
Rack travel in mm : 5.70...5.90
Rack travel in mm : 2.00
Speed rpm : 575...635

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 11.20...11.30
2nd speed rpm : 700
Rack travel in m: 12.50...12.70
4th speed rpm : 950
Rack travel in m: 11.80...12.00

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 700
Del.quantity cm³/ : 123.0...127.0
1000 s: (121.0...129.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 10.20
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 135.0...149.0
1000 s: (132.0...152.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 5.70...5.90
Del.quantity cm³/ : 16.5...20.5
1000 s: (14.0...23.0)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a82
 Edition : 24.10.90
 Replaces : 26.3.90
 Test oil : ISO-4113

Combination no. : 9 400 083 449CI

Injection pump
 Pump designation : PES6A100D320/3RS2691
 EP type number : 9 410 230 025
 Governor
 Governor design. : RSV400...1100A2C2209
 Governor no. : 9 420 083 201
 Cust. part no. : 3354421-VERSA028

Customer-spec. information
 Customer : CUMMINS

Engine : 6 CT 8.3

1st version kW : 154.6
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...2.95)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00
 & maximum rack tra: 21.00
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.70...11.80

Del.quantity cm³/ : 11.5...11.7

100 s: (11.3...11.9)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.2...5.4

Del.quantity cm³/ : 1.1...1.5

100 s: (0.8...1.7)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension
 Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 115.0...117.0

1000 : (113.0...119.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 85...93

Spread cm³ : 3.50
1000 s: (5.50)

Testing:

1st rack travel in: 10.70
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1180...1210
4th rack travel in: 1350
Speed rpm : 0.30...1.70

Remarks:

:
Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1

LOW IDLE 1

Control lever
position degrees: 62...70
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 4.8

Testing:

Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 400
Rack travel in mm : 5.20...5.40
Rack travel in mm : 2.00
Speed rpm : 525...585

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 11.70...11.80
2nd speed rpm : 500
Rack travel in m: 11.70...11.90
5th speed rpm : 400
Rack travel in m: 12.10...12.60

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 10.70
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 135.0...149.0
1000 s: (132.0...152.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 5.20...5.40
Del.quantity cm³/ : 11.0...15.0
1000 s: (8.5...17.5)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a88
 Edition : 24.10.90
 Replaces : -
 Test oil : ISO-4113

 Combination no. : 9 400 083 449CJ

 Injection pump
 Pump designation : PES6A100D320/3RS2691
 EP type number : 9 410 230 025
 Governor
 Governor design. : RSV400...1100A2C2209
 R
 Governor no. : 9 420 083 201

 Cust. part no. : 3354437-VERSA029

 Customer-spec. information
 Customer : CUMMINS

 Engine : 6 CT 8.3 L

 1st version kW : 132.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

 Overflow valve : 1 417 413 047

 Inlet press., bar : 1.50

 Test nozzle holder
 assembly : 0 681 343 009

 Opening
 pressure, bar : 172...175

 Test Lines : 1 680 750 014

 Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

 (A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...2.95)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00
 & maximum rack tra: 21.00
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 10.40...10.50

Del.quantity cm³/ : 9.3...9.5

100 s: (9.1...9.7)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.4...5.6

Del.quantity cm³/ : 1.3...1.7

100 s: (1.0...1.9)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 93.0...95.0

1000 : (91.0...97.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 90...98

Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:
Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1

Testing:
1st rack travel in: 9.40
Speed rpm : 1290...1300
2nd rack travel in: 4.00
Speed rpm : 1320...1350
4th rack travel in: 1500
Speed rpm : 0.30...1.70

LOW IDLE 1
Control lever
position degrees: 62...70
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 5.0

Testing:
Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 400
Rack travel in mm : 5.40...5.60
Rack travel in mm : 2.00
Speed rpm : 485...545

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 1250
Rack travel in m: 10.40...10.50
2nd speed rpm : 500
Rack travel in m: 10.40...10.60
5th speed rpm : 400
Rack travel in m: 10.80...11.30

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 9.40
Speed rpm : 1290...1300

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 135.0...149.0
1000 s: (132.0...152.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 5.40...5.60
Del.quantity cm³/ : 13.0...17.0
1000 s: (10.5...19.5)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a89
 Edition : 24.10.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 9 400 083 449DB
 Injection pump
 Pump designation : PES6A100D320/3RS2691
 EP type number : 9 410 230 025
 Governor
 Governor design. : RSV400...1100A2C2209
 R
 Governer no. : 9 420 083 201
 Cust. part no. : 3354685-VERSA031
 Customer-spec. information
 Customer : CUMMINS
 Engine : 6 CT 8.3 l
 1st version kW : 129.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 047
 Inlet press., bar : 1.50
 Test nozzle holder assembly : 0 681 343 009
 Opening pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...2.95)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)
 Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE
 betw. rack trav. m: 9.00...12.00
 & maximum rack tra: 21.00
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1100
 Rack travel in mm : 10.10...10.20
 Del.quantity cm³/ : 8.7...8.9
 100 s: (8.5...9.1)

Spread cm³ : 0.3
 100 s: (0.6)

2nd speed rpm : 400.0
 Rack travel in mm : 5.4...5.6
 Del.quantity cm³/ : 1.4...1.8
 100 s: (1.1...2.0)
 Spread cm³ : 0.3
 100 s: (0.5)

GUIDE SLEEVE POSITION
 Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension
 Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1100
 Del.quantity : 87.0...89.0
 1000 : (85.0...91.0)
 Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 85...93

Testing:

1st rack travel in: 9.10
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1170...1200
4th rack travel in: 1350
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 62...70
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 5.0

Testing:

Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 400
Rack travel in mm : 5.40...5.60
Rack travel in mm : 2.00
Speed rpm : 485...545

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 10.10...10.20
2nd speed rpm : 500
Rack travel in m: 10.10...10.30
5th speed rpm : 400
Rack travel in m: 10.50...11.00

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 500
Del.quantity cm³/ : 71.5...74.5
1000 s: (69.0...77.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 9.10
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 135.0...149.0
1000 s: (132.0...152.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 5.40...5.60
Del.quantity cm³/ : 14.0...18.0
1000 s: (11.5...20.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:
Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a90
 Edition : 24.10.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 9 400 083 449DC
 Injection pump
 Pump designation : PES6A100D320/3RS2691
 EP type number : 9 410 230 025
 Governor
 Governor design. : RSV400...1100A2C2209
 R
 Governor no. : 9 420 083 201
 Cust. part no. : 3354686-VERSA032
 Customer-spec. information
 Customer : CUMMINS
 Engine : 6 CTA - 8.3 l
 1st version kW : 148.4
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 047
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 0 681 343 009
 Opening
 pressure, bar : 172...175
 Test lines : 1 680 750 014
 Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600
 (A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...2.95)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00
 & maximum rack tra: 21.00
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1100
 Rack travel in mm : 10.80...10.90
 Del.quantity cm³/ : 9.6...9.8
 100 s: (9.4...10.0)

Spread cm³ : 0.3
 100 s: (0.6)
 2nd speed rpm : 400.0
 Rack travel in mm : 5.6...5.8
 Del.quantity cm³/ : 1.6...2.0
 100 s: (1.3...2.2)
 Spread cm³ : 0.3
 100 s: (0.5)

GUIDE SLEEVE POSITION
 Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension
 Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1100
 Del.quantity : 96.5...98.5
 1000 : (94.5...100.5)
 Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 85...93

Testing:
1st rack travel in: 9.80
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1175...1205
4th rack travel in: 1350
Speed rpm : 0.30...1.70

LOW IDLE 1
Control lever
position degrees: 62...70
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 5.2

Testing:
Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 400
Rack travel in mm : 5.60...5.80
Rack travel in mm : 2.00
Speed rpm : 490...550

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 10.80...10.90
2nd speed rpm : 500
Rack travel in m: 10.80...11.00
5th speed rpm : 400
Rack travel in m: 11.20...11.70

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 500
Del.quantity cm³/ : 81.0...84.0
1000 s: (78.5...86.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 9.80
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 135.0...149.0
1000 s: (132.0...152.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 5.60...5.80
Del.quantity cm³/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:
Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a91
 Edition : 24.10.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 9 400 083 450AH
 Injection pump
 Pump designation : PES6A100D320/3RS2691
 EP type number : 9 410 230 025
 Governor
 Governor design. : RSV375...1150A2C2210
 Governer no. : 9 420 083 202
 Cust. part no. : 3352889-VERSA007
 Customer-spec. information
 Customer : CUMMINS
 Engine : 6 C 8.3 l
 1st version kW : 105.0
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 047
 Inlet press., bar : 1.50
 Test nozzle holder assembly : 0 681 343 009
 Opening pressure, bar : 172...175
 Test Lines : 1 680 750 014
 Outside diameter x Wall thickness x Length mm : 6.00x2.00x600
 (A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...2.95)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00
 & maximum rack tra: 21.00
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 10.40...10.50

Del.quantity cm³/ : 8.7...8.9

100 s: (8.5...9.1)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 375.0
 Rack travel in mm : 5.6...5.8
 Del.quantity cm³/ : 1.1...1.5
 100 s: (0.8...1.7)
 Spread cm³ : 0.3
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension
 Click setting x : 3.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250
 Del.quantity 1000 : 87.5...89.5
 1000 : (85.5...91.5)
 Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 94...102

Spread cm³ : 3.50
1000 s: (5.50)

Testing:

1st rack travel in: 9.40
Speed rpm : 1290...1300
2nd rack travel in: 4.00
Speed rpm : 1330...1360
4th rack travel in: 1500
Speed rpm : 0.30...1.70

Remarks:

:
Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1

LOW IDLE 1

Control lever
position degrees: 64...72
Setting point w/out bumper spring
Speed rpm : 375
Rack travel in mm : 5.2

Testing:

Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 375
Rack travel in mm : 5.60...5.80
Rack travel in mm : 2.00
Speed rpm : 475...535

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1250
Rack travel in m: 10.40...10.50
2nd speed rpm : 500
Rack travel in m: 10.40...10.60
5th speed rpm : 400
Rack travel in m: 10.80...11.30

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 9.40
Speed rpm : 1290...1300

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 135.0...149.0
1000 s: (132.0...152.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 375
Rack travel in mm : 5.60...5.80
Del.quantity cm³/ : 11.0...15.0
1000 s: (8.5...17.5)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 b12
 Edition : 24.10.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 9 400 083 452CF
 Injection pump
 Pump designation : PES6A100D320/3RS2691
 -2
 EP type number : 9 410 230 028
 Governor
 Governor design. : RQV350...1250AB1225R
 Governor no. : 9 420 080 224
 Cust. part no. : 3353986-VERSA025
 Customer-spec. information
 Customer : CUMMINS
 Engine : 6 CT 8.3 l
 1st version kW : 145.0
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 047
 Inlet press., bar : 1.50
 Test nozzle holder assembly : 0 681 343 009
 Opening pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter x Wall thickness x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...2.95)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00
 & maximum rack tra: 21.00
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 11.30...11.40

Del.quantity cm³/ : 10.5...10.7

100 s: (10.3...10.9)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0
 Rack travel in mm : 5.4...5.6
 Del.quantity cm³/ : 1.4...1.8
 100 s: (1.1...2.0)
 Spread cm³ : 0.3
 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1265
 travel mm : 8.50...8.60
 2nd speed rpm : 900
 travel mm : 5.60...6.00
 3rd speed rpm : 500
 travel mm : 3.80...4.20
 4th speed rpm : 350
 travel mm : 1.60...2.50

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1300
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1150
Del.quantity : 105.5...107.5
1000 : (103.5...109.5)
Spread cm³ : 3.50
1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 111...119

Testing:

1st rack travel in: 10.30
Speed rpm : 1190...1200
2nd rack travel in: 4.00
Speed rpm : 1300...1330
4th rack travel in: 1450
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 67...75

Testing:

Speed rpm : 100
Minimum rack trave: 10.00
Speed rpm : 350
Rack travel in mm : 5.40...5.60

CONSTANT REGULATION

Speed rpm : 390...460

TORQUE CONTROL

Dimension a mm : 0.70
Torque control curve - 1st version
1st speed rpm : 1150
Rack travel in m: 11.30...11.40
2nd speed rpm : 750
Rack travel in m: 12.00...12.10
4th speed rpm : 950
Rack travel in m: 11.50...11.80

START CUT-OUT

Speed 1/min : 290 (310)

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 750
Del.quantity cm³/ : 114.0...117.0
1000 s: (111.5...119.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.30
Speed rpm : 1190...1200
STARTING FUEL DELIVERY
Speed rpm : 100
Del.quantity cm³/ : 168.0...182.0
1000 s: (165.0...185.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.40...5.60
Del.quantity cm³/ : 14.0...18.0
1000 s: (11.5...20.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:
Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM 5,9 c
 Edition : 26.03.90
 Replaces : 4.85
 Test oil : ISO-4113

Combination no. : 9 400 085 239

Injection pump
 Pump designation : PES6A90D320RS2701
 EP type number : 9 400 083 094
 Governor
 Governor design. : RSV350...1150A2B2097
 Governor no. : 9 420 083 197

Customer-spec. information
 Customer : MWM

Engine : TD229-6

1st version kW : 106.7
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 046

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 2.65...2.75
 : (2.60...2.70)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00
 & maximum rack tra: 21.00
 Difference ° CS : 4.00...5.00

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 10.80...10.90

Del.quantity cm³/ : 8.1...8.2

100 s: (7.9...8.4)

Spread cm³ : 0.3

100 s: (0.5)

2nd speed rpm : 350.0

Rack travel in mm : 5.3...5.5

Del.quantity cm³/ : 0.8...1.2

100 s: (0.6...1.4)

Spread cm³ : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 81.0...82.0

1000 : (79.0...84.0)

Spread cm³ : 3.00

1000 : (5.00)

RATED SPEED

1st version

Control lever
position degrees: 93...101

Speed rpm : 100
Rack travel in mm : 19.00...21.00

Testing:

1st rack travel in: 9.80
Speed rpm : 1190...1200
2nd rack travel in: 4.00
Speed rpm : 1240...1270
4th rack travel in: 1350
Speed rpm : 0.30...1.70

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.30...5.50
Del.quantity cm³/ : 8.0...12.0
1000 s: (6.0...14.0)
Spread cm³ : 2.50
1000 s: (4.50)

LOW IDLE 1

Control lever
position degrees: 67...75
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 4.9

Remarks: : VALMET
APPLICATION
Tractor (tractor engines)

Testing:

Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 350
Rack travel in mm : 5.30...5.50
Rack travel in mm : 2.00
Speed rpm : 540...600

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1150
Rack travel in m: 10.80...10.90
2nd speed rpm : 500
Rack travel in m: 11.20...11.30
3rd speed rpm : 700
Rack travel in m: 11.20...11.30
4th speed rpm : 950
Rack travel in m: 11.00...11.10

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500
Del.quantity cm³/ : 74.5...76.5
1000 s: (72.0...79.0)
Speed rpm : 700
Del.quantity cm³/ : 77.0...79.0
1000 s: (74.5...81.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.80
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM 2,9 a
 Edition : 26.03.90
 Replaces : 4.85
 Test oil : ISO-4113

 Combination no. : 9 400 085 241

 Injection pump
 Pump designation : PES3A90D320RS2703
 EP type number : 9 400 083 096
 Governor
 Governor design. : RSV350...1150A2B2129
 -4R
 Governor no. : 9 420 083 193

 Customer-spec. information
 Customer : MWM

 Engine : D 229-3

 1st version kW : 42.7
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

 Overflow valve : 1 417 413 000

 Inlet press., bar : 1.50

 Test nozzle holder
 assembly : 0 681 343 009

 Opening
 pressure, bar : 172...175

 Test lines : 1 680 750 003

 Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 2.65...2.75
 : (2.60...2.80)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 2- 3

Phasing : 0-120-240

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00
 & maximum rack tra: 21.00
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 8.50...8.60

Del.quantity cm³/ : 5.8...5.9

100 s: (5.6...6.1)

Spread cm³ : 0.3

100 s: (0.5)

2nd speed rpm : 350.0

Rack travel in mm : 5.5...5.7

Del.quantity cm³/ : 1.1...1.5

100 s: (0.9...1.7)

Spread cm³ : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 58.0...59.0

1000 : (56.0...61.0)

Spread cm³ : 3.00

1000 : (5.00)

RATED SPEED

1st version

Control lever
position degrees: 93...101

Remarks:

: VALMET

Testing:

1st rack travel in: 7.50
Speed rpm : 1190...1200
2nd rack travel in: 4.00
Speed rpm : 1220...1250
4th rack travel in: 1400
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 73...81
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.1

Testing:

Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 350
Rack travel in mm : 5.50...5.70
Rack travel in mm : 2.00
Speed rpm : 545...605

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1150
Rack travel in m: 8.50...8.60
2nd speed rpm : 500
Rack travel in m: 9.40...9.50
4th speed rpm : 800
Rack travel in m: 8.90...9.10

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 500
Del.quantity cm³/ : 54.0...56.0
1000 s: (51.5...58.5)
Speed rpm : 800
Del.quantity cm³/ : 60.5...62.5
1000 s: (58.0...65.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 7.50
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100
Rack travel in mm : 19.00...21.00

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 5,7 n 25
 Edition : 26.03.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 9 400 085 247
 Injection pump
 Pump designation : PES6A90D410RS2293
 EP type number : 0 410 896 031
 Governor
 Governor design. : RQV400...1400AB1214L
 Governer no. : 9 420 080 206
 Customer-spec. information
 Customer : MERCEDES-BENZ
 Engine : OM 352 A
TEST BENCH REQUIREMENTS
 Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 000
 Inlet press., bar : 1.50
 Test nozzle holder assembly : 0 681 343 009
 Opening pressure, bar : 172...175
 Test lines : 1 680 750 003
 Outside diameter x Wall thickness x Length mm : 6.00X2.00X600
(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____
BEGINNING OF DELIVERY
 Test pressure, bar: 25...27
 Prestroke mm : 2.20...2.30
 : (2.15...2.35)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)
BASIC SETTING
 1st speed rpm : 1400
 Rack travel in mm : 11.20...11.30
 Del.quantity cm³/ : 7.5...7.6
 100 s: (7.3...7.8)
 Spread cm³ : 0.3
 100 s: (0.5)
 2nd speed rpm : 400.0
 Rack travel in mm : 6.9...7.1
 Del.quantity cm³/ : 1.1...1.5
 100 s: (0.9...1.7)
 Spread cm³ : 0.2
 100 s: (0.4)
(B) Setting of injection pump with governor
GUIDE SLEEVE TRAVEL
 1st speed rpm : 1460
 travel mm : 8.40...8.60
 2nd speed rpm : 950
 travel mm : 5.20...5.50
 3rd speed rpm : 775
 travel mm : 4.10...4.60
 4th speed rpm : 550
 travel mm : 2.70...3.00
 5th speed rpm : 300
 travel mm : 0.70...1.20
GUIDE SLEEVE POSITION
 Control-lever position
 Degree: -1
 Speed rpm : 1420
 Rack travel in mm : 15.20...17.80
FULL LOAD DELIV. AT FULL LOAD STOP
 1st version
 Speed rpm : 1400
 Aneroid pressure h: 200
 Del.quantity : 75.5...76.5
 1000 : (73.5...78.5)
 Spread cm³ : 3.00
 1000 : (5.00)
RATED SPEED
 1st version

Control lever
position degrees: 57...65

Testing:

1st rack travel in: 10.20
Speed rpm : 1440...1450
2nd rack travel in: 4.00
Speed rpm : 1560...1590
4th rack travel in: 1750
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 12...20

Testing:

Speed rpm : 100
Minimum rack trave: 8.50
Speed rpm : 400
Rack travel in mm : 6.90...7.10

CONSTANT REGULATION

Speed rpm : 350...475

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 200
Rack travel mm : 11.20...11.30

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.60...10.70
2nd pressure hPa : 115
Rack travel in m: 11.00...11.10
3rd pressure hPa : 90
Rack travel in m: 10.70...10.90

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 200
Speed rpm : 500
Del.quantity cm3/ : 58.5...60.5
1000 s: (56.0...63.0)

Aneroid pressure h: -

Speed rpm : 500
Del.quantity cm3/ : 51.0...54.0
1000 s: (49.5...56.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.20
Speed rpm : 1440...1450

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 70.0...80.0
1000 s: (67.0...83.0)
Rack travel in mm : 13.80...14.20

LOW IDLE

Speed rpm : 400
Rack travel in mm : 6.90...7.10
Del.quantity cm3/ : 11.5...15.5
1000 s: (9.5...17.5)
Spread cm3 : 2.50
1000 s: (4.50)

Remarks:

:

APPLICATION

Navy

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM 3,9 a 1
 Edition : 26.03.90
 Replaces : 3.86
 Test oil : ISO-4113

 Combination no. : 9 400 085 268

 Injection pump
 Pump designation : PES4A90D320RS2702
 EP type number : 9 400 083 095
 Governor
 Governor design. : RSV350...1150A2B2129
 -7R
 Governor no. : 9 420 083 212

 Customer-spec. information
 Customer : MWM

 Engine : TD 229 EC-4

 1st version kW : 66.2
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

 Overflow valve : 1 417 413 012

 Inlet press., bar : 1.50

 Test nozzle holder assembly : 0 681 343 009

 Opening pressure, bar : 172...175

 Test lines : 1 680 750 003

 Outside diameter x Wall thickness x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 2.65...2.75
 : (2.60...2.80)

Rack travel in mm : 9.00...12.00
 Firing order : 1-3-4-2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00
 & maximum rack tra: 21.00
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 10.30...10.40

Del.quantity cm³/ : 7.7...7.8

100 s: (7.5...8.0)

Spread cm³ : 0.3

100 s: (0.5)

2nd speed rpm : 350.0

Rack travel in mm : 5.5...5.7

Del.quantity cm³/ : 1.1...1.5

100 s: (0.9...1.7)

Spread cm³ : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 77.5...78.5

1000 : (75.5...80.5)

Spread cm³ : 3.00

1000 : (5.00)

RATED SPEED

1st version

Control lever
position degrees: 94...102

Testing:

1st rack travel in: 9.30
Speed rpm : 1190...1200
2nd rack travel in: 4.00
Speed rpm : 1240...1270
4th rack travel in: 1400
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 69...77
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.1

Testing:

Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 350
Rack travel in mm : 5.50...5.70
Rack travel in mm : 2.00
Speed rpm : 545...605

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1150
Rack travel in m: 10.30...10.40
2nd speed rpm : 500
Rack travet in m: 10.80...10.90
4th speed rpm : 700
Rack travel in m: 10.50...10.70

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500
Del.quantity cm³/ : 70.0...72.0
1000 s: (67.5...74.5)
Speed rpm : 700
Del.quantity cm³/ : 71.5...73.5
1000 s: (69.0...76.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.30
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.50...5.70
Del.quantity cm³/ : 11.0...15.0
1000 s: (9.0...17.0)
Spread cm³ : 2.50
1000 s: (4.50)

Remarks:

: VALMET